Volume XIX Number 5

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DISEASES OF THE NERVOUS SYSTEM

A Practical Journal on Psychiatry and Neurology

MAY
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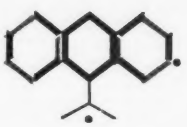

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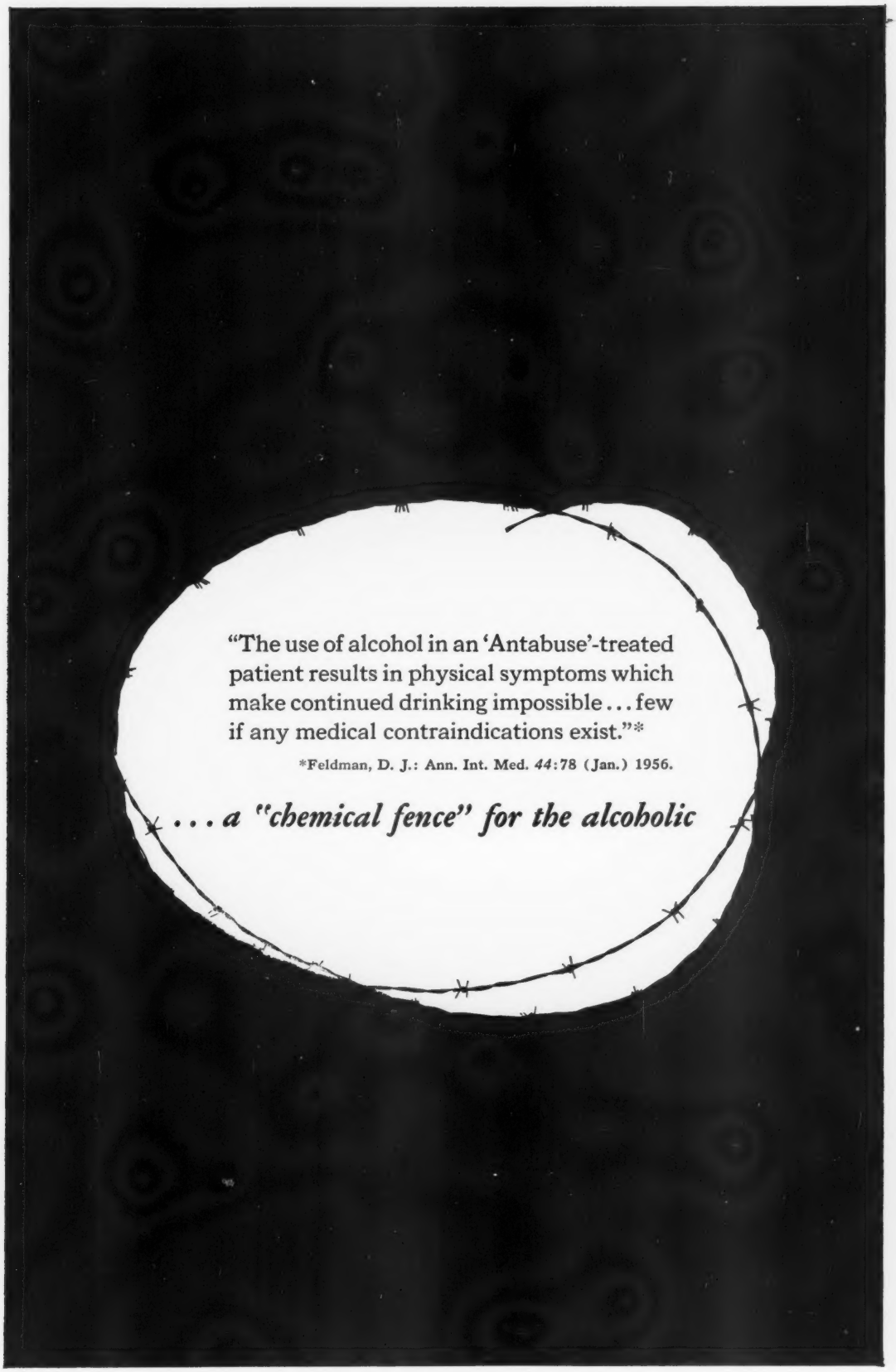
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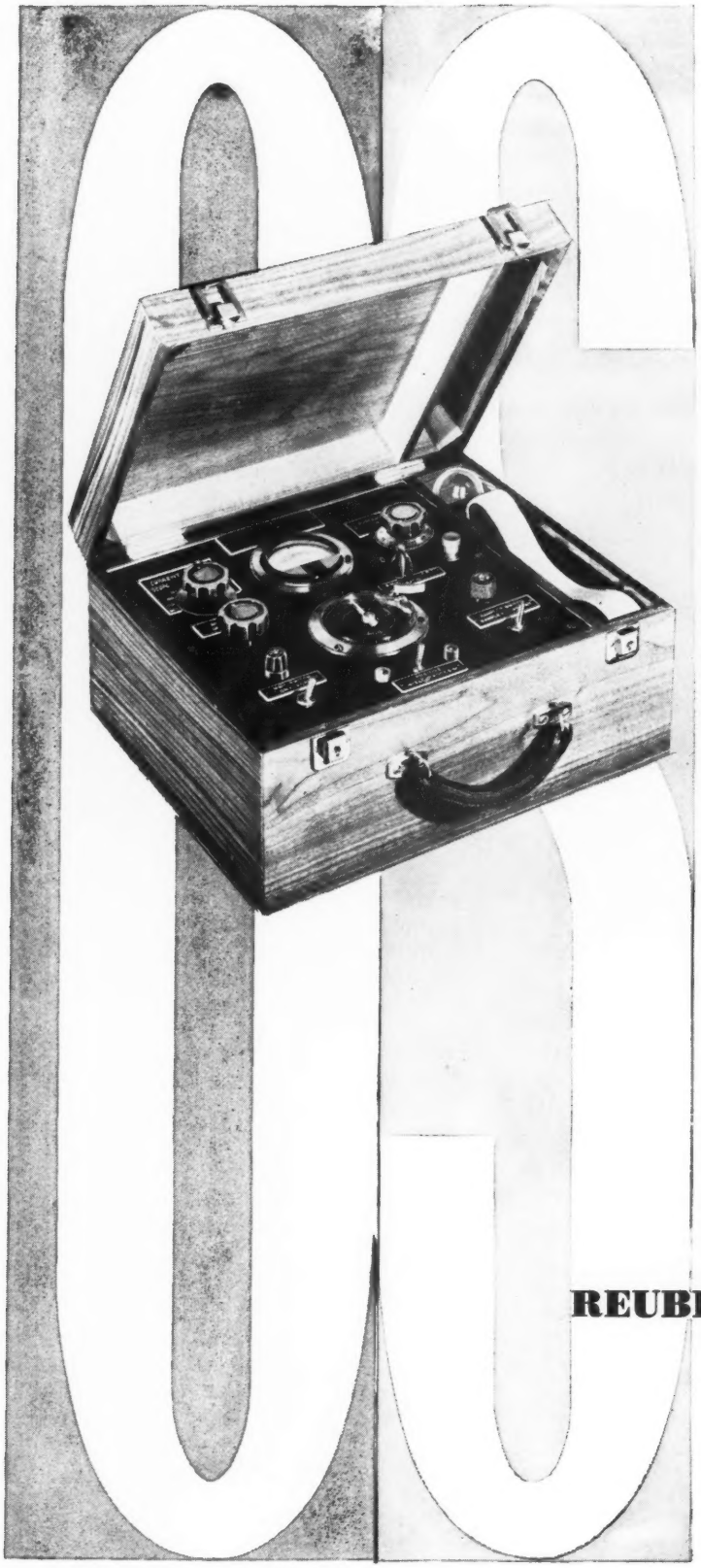

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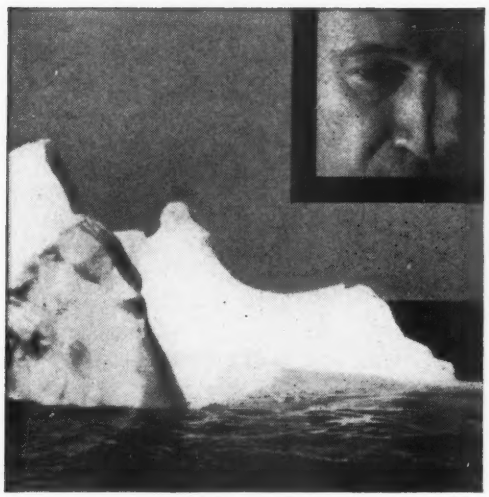

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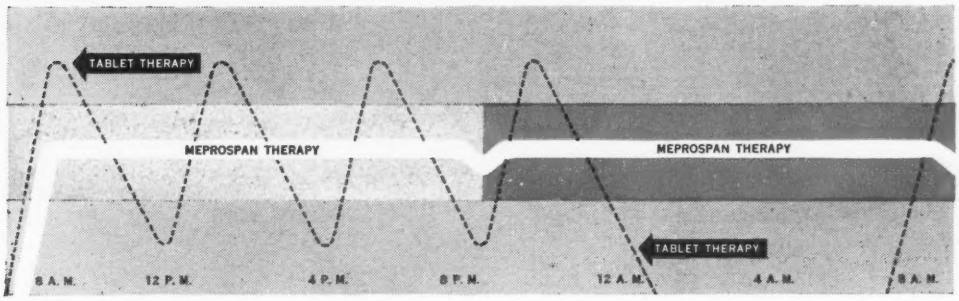

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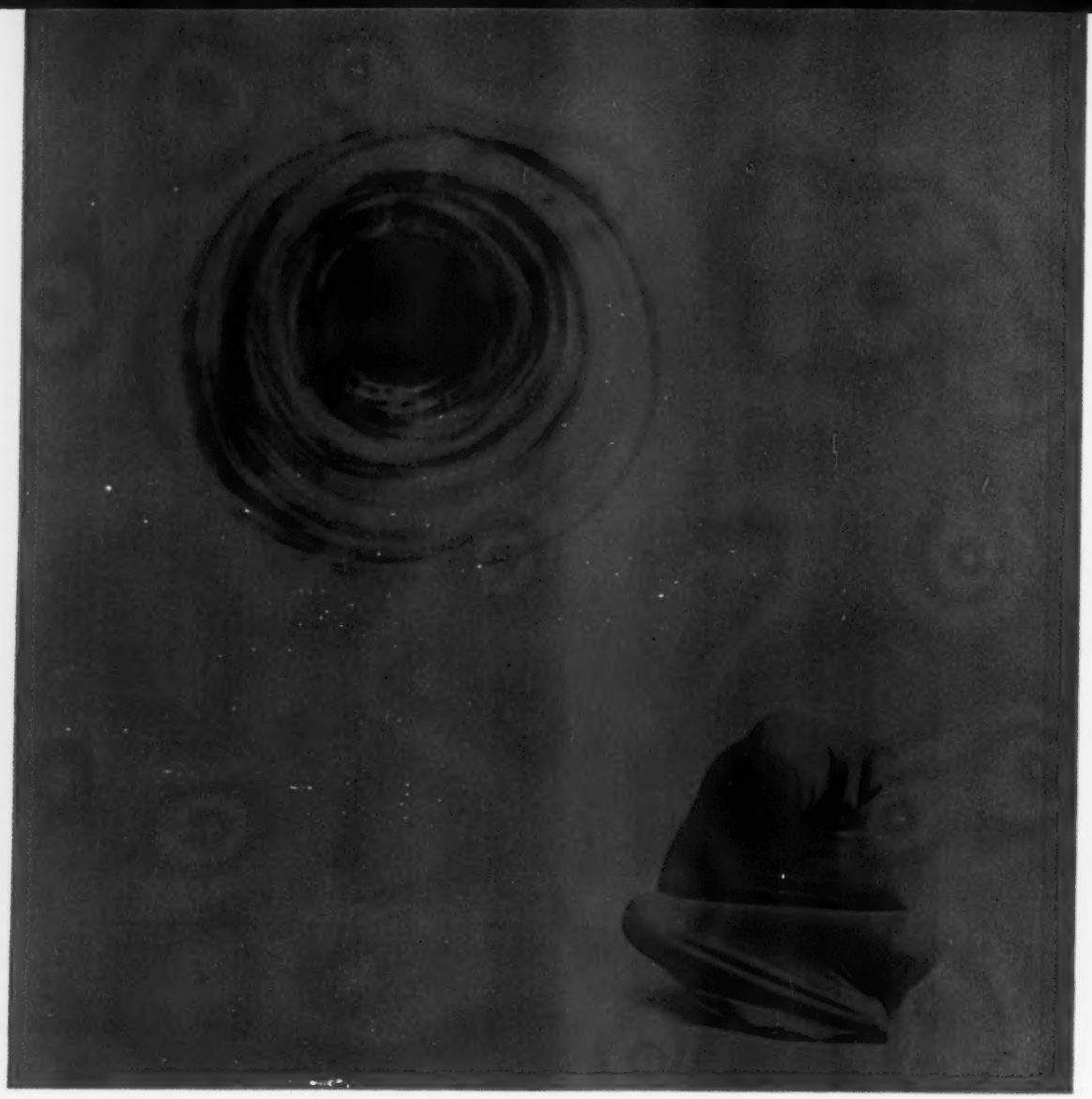

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DISEASES *of the* Nervous System

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Effects of Lobotomy in Childhood

H. C. HOLLAND, M.D., E. G. NEWMAN, M.D., and L. B. HOHMAN, M.D.

During the period 1946 to 1950 a number of children and a few adolescents were subjected to lobotomy at Duke Hospital. All these cases presented such severe behavior problems that any type of treatment seemed justified—even lobotomy. A few of the cases were probably post-encephalitic but most of them were regarded as childhood schizophrenia or Heller's disease.

Our cases were of such severe variety that we felt that the prognosis in all was uniformly bad. Most authors and investigators,[1,2,3,4,5] are in agreement that all of the severe cases offer practically no hope for improvement. Our principle for recommending lobotomy was that when the prognosis was thought to be very poor and the behavior problems so severe that nothing short of permanent institutional care was forseeable, that it was legitimate to recommend this drastic procedure.

The present study represents a "follow up" on all the cases of lobotomy in children or young adolescents performed at the Duke Hospital during the period mentioned. The "follow up" was undertaken by two of the authors (H. C. H. and E. G. N.), while they were senior students in the Duke University School of Medicine. They visited every patient in person. The case histories are included in this report.

In the tabulation of our cases it can readily be seen that before lobotomy, seven of the 12 cases were severely hostile, 10 destructive, and that none could be in school or at work. Within three years after operating only four of the 12 were hostile, only seven were destructive and two were returned to work or school. Three years or more after lobotomy, only one remained hostile, none were destructive and seven were in school or at work.

Of course, the more favorable course in these cases cannot necessarily be attributed to the lobotomy. It is possible that maturation may have played a part in the amelioration of symptoms. On the other hand, in the post-encephalitic behavior disturbances, no lessening of bad symptoms could be observed in the course of growth. It would not be unreasonable to hypothecize that lobotomy may have been beneficial. At least it cannot be argued that lobotomy worsened the illness.

Case No. 1: Ruth B. was apparently normal from birth until the age of six months when she had intestinal flu and measles and probably encephalitis. She was not severely ill but her parents noted that following these illnesses she regressed in behavior (sitting up, etc.). From that time forward she was very slow in development and when first seen at Duke Hospital at the age three, she was unable to talk except for occasional words. Her physical examination, neurological examination, and routine laboratory studies were within normal limits. Bone age roentgenograms corresponded to the chronological age. The impression at that time was mental retardation with hyperkinesis, probably post-encephalitic.

Subsequent glutamic acid therapy was unsuccessful and in the ensuing years the child became progressively more hyperactive and aggressive. She became a severe management problem at home. Since institutionalization was impossible at that time, lobotomy was recommended. In 1951, at the age of eight, the patient had a complete bilateral prefrontal lobotomy in the plane of the coronal suture and the sphenoidal ridge. After a trial of several months at home, she was hospitalized at the Caswell Training School for defective children.

On admission, Ruth was found to have an I.Q. of 10 (Gesell), and was therefore placed in the "non-trainable" group, receiving simple custodial care. She has remained somewhat hyperactive, but is not nearly so destructive as previously. Restraint is no longer necessary, and when interviewed seven years after onset of symptoms and three years after lobotomy, she seemed happy and non-aggressive.

From Duke University School of Medicine, Durham, N. C.

Case No. 2: Elaine M. had developed normally until she became critically ill with an encephalitis at age 15 months. During her illness she began to have grand mal seizures which continued after recovery from the acute febrile illness. Her behavior became hyperactive, purposeless, and destructive. Her parents could only control her outdoors by tying her to a tree. She was admitted to a state hospital for epileptic children at the age of six, and was then transferred to another state hospital where surgical facilities were available for lobotomy. She was seen there by Drs. Hohman and Wilson. Physical examination, neurological examination, and routine laboratory studies were within normal limits. Shortly after transfer the patient had a complete bilateral prefrontal lobotomy in the plane of the coronal suture and the sphenoidal ridge.

She was returned to the epileptic colony and has been on anticonvulsant therapy (Mesantoin and phenobarbital) continuously up to the present time. During the four years since her operation she has had only one convulsion and that during a febrile state.

When we visited her recently, eight years after onset of symptoms and four years since lobotomy, the patient did not speak. We were informed that her behavior is moderately hyperactive and that she is occasionally destructive of clothing but is not aggressive toward people. Her intellect remains in the idiot range and she is completely untrainable but does not pose any special problem in management.

Case No. 3: Richard W. was first seen at Duke Hospital in 1950 at the age of seventeen. He was brought to the hospital because of threats to kill his parents. The onset of the mental illness three years preceeding had been characterized by abnormal preoccupation with sexual topics and excessive vulgarity. In Duke Hospital he was extremely violent, tore apart two hospital rooms, and refused to eat or drink. Physical examination, neurological examination, and routine laboratomy studies were within normal limits. He was diagnosed as hebephrenic schizophrenia. A complete bilateral prefrontal lobotomy was performed in the plane of the coronal suture and the sphenoidal ridge. Following his operation he was noted to be less destructive.

Several weeks later he was transferred to a state hospital. His behavior continued destructive during the first year in the hospital. One year after admission he was started on a course of insulin coma therapy because he demonstrated stereotypy, bizarre gestures, and hallucinations. He was given a total of 62 treatments and 50 comas over a period of three months, with only modest results. He continued to have a fluctuating course, and still occasionally molests nurses.

One year after the insulin therapy he was given a course of 14 electroshock treatments, again only with modest results. Two Wechsler-Bellevue tests one year apart showed an increase in I.Q. from 93 to 108.

In the past six months, the patient has spontaneously shown remarkable improvement and has been working regularly in the hospital laundry. He has a grounds pass, takes an active part in chapel services every Sunday, and states that he is beginning to like his hospital environment. When we saw him seven years after onset of illness and four years after operation, he was interested in the current basketball standings.

Case No. 4: William M. was first seen in the dermatology out-patient clinic of Duke Hospital in 1947 at the age of seventeen, with a complaint of severe acne of several years' duration. On subsequent visits his behavior and thought showed such obsessive preoccupation concerning his skin condition that he was referred to neuropsychiatry for evaluation.

The report revealed a severely obsessive-compulsive individual, with additional symptoms which made it clear that the diagnosis was schizophrenia. He was admitted to the psychiatric ward of Duke Hospital for further observation. Except for acne, the physical examination, the neurological examination, and routine laboratory studies were within normal limits. He was lobotomized in April 1948. The section was made in a plane 1.5 cm. anterior to the coronal suture line superiorly and to a point 1.0 cm. anterior to the coronal suture line inferiorly.

Following the operation he had about 30 hours psychotherapy while still in the hospital. He seemed improved and was discharged to his home. His preoccupation with his appearance abated, but he was unable to work without loss of temper and again became threatening to his family. In January 1949, he was a voluntary patient at the state hospital because "he was often cruel to his mother and members of his family, and once threatened to kill himself." After a brief stay in the hospital he returned home but continued the same behavior. In 1953 six years after operation he was a voluntary patient at another state hospital because of hypochondriac symptoms centered around a "bad heart." After a stay of six weeks he returned home. He has since had two jobs both of which he quit, and is now helping with the family's business, a chicken hatchery.

When seen at his home in March 1954, approximately nine years after onset of illness and six years after lobotomy, he seemed relatively at ease and spontaneous in speech. He was, as he has always been, well-groomed. He denied any special preoccupations at that time. He spoke freely of his previous "imaginary heart trouble" and stated that it was not bothering him nearly as much as it had a year ago. He agreed with his mother that he tends to "worry about things excessively." He considers his work in the family chicken hatchery as temporary and plans to go to work soon as a repairman in a furniture store. He occasionally dates girls, but has no immediate plans for marriage.

Case No. 5: William S. developed normally until the age three years when he suffered two accidents with possible cerebral concussions. There was no loss of consciousness. After the second injury his

speech deteriorated and he became unmanageable. He became aggressive, destroyed furniture, and struck people who came near him. Although he was previously toilet trained and properly modest, he began to urinate in public places.

The patient was brought to Duke Hospital. The physical and neurological examinations and the routine laboratory studies were within normal limits. The diagnostic impression was severe personality disorder on an organic basis. Soon after admission in July 1949, at the age of six years, a complete bilateral prefrontal lobotomy was performed in a plane beginning 1.5 cm. anterior to the coronal suture line and extending to a point 1.0 cm. anterior to the coronal suture line inferiorly. He remained aggressive and hyperactive, although his toilet habits did improve. His behavior was still unacceptable two years later, at which time he was shown to have an I.Q. of 56 (Merrill-Palmer).

He was started on Dexedrine sulfate with some beneficial results, but finally in 1953 he had to be placed in the Caswell Training School for defective children. After a short time he began to demonstrate erratic, destructive, sadistic behavior. Dexedrine therapy was resumed and he is now back in class. His teachers report that he is doing well and poses no special problem.

When we saw him eight years after onset of illness and five years since lobotomy, he was in the infirmary with a mild pharyngitis. He was not hyperactive, speech was coherent, and the content of his thought centered around leaving the infirmary and returning to the cottage where his friends and classmates live.

Case No. 6: Norborne W. was admitted to Duke Hospital at the age of seven and one-half years for evaluation for lobotomy. His unusual behavior first appeared when he was two and one-half years, prior to which his development had been normal and he had required little attention. His mother stated that he was "too good." At the age of two and one-half he became hyperactive, running and jumping, banging his head, and beating himself on the chest and head. He became completely unmanageable. His speech deteriorated and he jabbered or screamed most of the time. He was seen at weekly intervals in a mental hygiene clinic with no benefit. At the age of three and one-half he was seen by Dr. Redwood of Norfolk, Virginia, and also by Dr. Kanner of Baltimore, Maryland. An air encephalogram was reported normal. Both these physicians gave a poor prognosis and advised custodial care.

Brief periods of hospitalization in two institutions and special training by a tutor for a longer period produced little improvement. By the age of seven he had become even more hyperactive. He ran about wildly, hitting and scratching himself as well as anyone who came near him.

At that time he was brought to Duke Hospital. On admission to the psychiatric ward, the physical and neurological examinations and routine laboratory studies were normal, except for a cataract on the left eye, which was secondary to a trauma incurred during an episode of hyperactivity. It was felt that his behavior disturbance was due to organic brain damage but a diagnosis of Heller's disease was entertained. In June 1950, a complete bilateral prefrontal lobotomy was performed in the plane of the coronal suture, extending inferiorly to the sphenoidal ridge. After the operation the patient seemed much improved. His hyperactivity was diminished and he no longer scratched or struck himself or others.

When we visited him at home, the mother stated that he has not been aggressive or destructive. She feels that he understands a great deal of what is said to him but that he remains a management problem because of wilful disobedience. He talks very little and his speech is slurred. One year ago he was placed in a class of five, but after a short period was considered untrainable by the teacher. When we saw him, the patient did not speak and was mildly hyperactive. He rolled on the floor several times, disobeying most of his mother's requests. He was, however, seen to obey several of her simple instructions.

Case No. 7: Oscar W. was first seen at Duke Hospital in 1949, at the age of eight, having been referred by Dr. Kinross-Wright of the Charlotte, N. C. Child Guidance Clinic. The onset of his illness dated from age four when he became seclusive, irritable, showed a restriction of interest in things about him, and his speech became markedly less productive. Prior to this time the patient had developed normally, walking and talking at the usual times. His behavior became progressively deteriorated. He began to adopt bizarre postures, grimaced, and became hyperactive and destructive. He was not, however, aggressive toward people. An attempt was made to start him in school, but he was unmanageable and had to be withdrawn. Two months prior to admission, Oscar was rated at an I.Q. (Stanford-Binet) of 36. A pneumoencephalographic study revealed no abnormalities.

On admission physical and neurological examinations and routine laboratory studies were within normal limits. The diagnosis of childhood schizophrenia was made.

On August 26, 1949 a bilateral prefrontal lobotomy was performed in a plane 1 cm. anterior to the coronal suture line down to the sphenoidal ridge. Within one week following the operation, the child became less hyperactive, his speech more intelligible, and he was much more easily managed. On a return visit one month following his operation, it was thought that he had continued to improve.

When seen at this home nine years after onset of symptoms, and five years after lobotomy, the patient did not speak at all. He would, however, point to things and emit a high-pitched sound (oooooop!). He was hyperactive and postured bizarrely with his arms. His parents report that he dresses himself and is interested in his pet rabbits, although he does not assume full responsibility for their care. He is neither aggressive nor destruc-

tive, but seems to have intellectually deteriorated in the last four years.

Case No. 8: Kermit C. was first seen in the Duke Hospital Clinic in December 1941 at the age of six. The chief complaint of the parents was that the child seemed mentally retarded and emotionally unstable. History from the parents revealed that the child was delivered by breech and was cyanotic at birth, but was quickly and easily resuscitated. Breast feeding was attempted but seemed unsatisfactory as the child did not get enough milk. His diet was supplemented with bottles and by the age of two months breast feeding was discontinued altogether. Eating patterns were stated to have been normal from that time on. The child began to walk and talk at the age of one year. In his second year, he began to mimic other people's speech and seemed slow to develop spontaneous speech. At the age of three he had night terrors. By the age of five the parents felt that he was definitely abnormal. He would repeat the same sentence for weeks at a time—"Nothing is going to get little Kermit." He seemed to like other children, but never learned to play with them, and spent much of his time sitting alone with a puzzled expression on his face. He laughed and cried at inappropriate times.

A physical examination was within normal limits at that time. The electroencephalogram showed small, rounded 20 per second waves in all leads, suggestive of widespread disturbance of cerebral electrical activity, with somewhat increased cortical irritability. The I.Q. was 51 (Stanford-Binet).

During the ensuing four years his behavior deteriorated. He became hyperactive, cried a great deal, screamed at times, became destructive and fought with members of the family. He was admitted to Duke Hospital in August 1945 and again physical examination was within normal limits. Three determinations of the BMR were —9%, —16%, and —9% respectively. The electroencephalograms at that time were within normal limits. The diagnosis was mental defificiency with psychosis, possible childhood schizophrenia. The patient received a course of five electroshock treatments which, however, did not appear to alter his behavior in any way.

The patient was readmitted in April 1950. His behavior was similar to that observed previously. Physicical and neurological examination and routine laboratory studies as well as the pneumoencephalogram were within normal limits. In April 1950 when the patient was fifteen years of age, a complete bilateral prefrontal lobotomy was performed in the coronal suture-sphenoidal ridge plane. Following the operation he showed a marked reduction in motility and one month following discharge a letter from his parents advised that he played with other children and was easily managed. Six months later, on a return visit he was found to be much less active than prior to lobotomy. He seemed shy and withdrawn, however, and did not talk. A repeat Stanford-Binet test gave an I.Q. of 23.

In our visit to his home the parents thought that he was showing marked improvement. He helps with house chores and assists his father. He does not talk too much, but does make his needs known. His mother stated that he has taken greater interest in his siblings and seemed "more one of us" in the past year. We were unable to elicit any answers to questions from the patient. During most of the interview he sat in a chair with his hand covering his eyes. This interview took place nine years from the onset of obvious symptoms and three years after lobotomy.

Case No. 9: Noel W. was first in Duke Hospital in June 1948 at age 12. He had been diagnosed as schizophrenic since he was six at the University of Iowa Children's Clinic, and then at the age of eight at Phipp's Clinic. The chief complaint at that time was that the child had become completely unmanageable due to his obsessive-compulsive behavior. He was very irritable, excessively talkative, and had angry spells in which he screamed. His "rituals" had become so excessive that it was impossible to adapt to his compulsions and he became violent if thwarted in his "rituals." He was very literal-minded and became very excited until any rhetorical exaggeration was explained to him. The patient had always been obsessively obedient and this had led to his being made the butt of practical jokes. For example, on one occasion he stood upside down leaning against a tree for two hours and would not resume normal posture until the boy who had commanded him gave him permission to come down.

The patient's birth and early development were said to have been normal. He walked and talked at the age of 18 months. It was at about the age of three that the mother first noted abnormalities in his behavior. At that age he had taught himself to read and the attending pediatrician predicted that the patient would be either a genius or psychotic. He started school at the age of six, but by the time he was ten, he had to be removed because the teachers could no longer handle him. Since that time, he has had private tutors at home.

In his stay on the Duke psychiatric ward observations confirmed the behavior described by his mother. The physical and neurological examinations were within normal limits and it was noted that his body type was dysplastic. Routine laboratory studies, the electrocardiogram, the oxyencephalogram, and the electroencephalogram were all interpreted as normal. The Stanford-Binet Test (Form L) gave an I.Q. of 115, with severe scatter on the subtest. The psychologist's conclusions were that the patient was of high average intelligence, with severe scatter of abilities. He was poorest at detection of absurdities and best at memory. His attitude was concrete.

In June 1948 at the age of twelve the patient underwent bilateral prefrontal lobotomy in a plane 1.5 cm. anterior to the coronal suture line, sparing 20 cm. of the orbital fibers. Post-operatively his physical course was benign but his psychiatric course was stormy. He was incontinent, smeared

feces, and was completely uncooperative. His obsessive-compulsive activity reappeared early but activity was quickly stopped by verbal direction. Within two weeks the incontinence had disappeared and it was believed at the time of his discharge that he was definitely improved. Eighteen months later, a re-evaluation of his intellect was done, the Wechsler-Bellevue test being administered. The full scale I.Q. was 117, and the scatter of the subtests was wide. His approach to the problems was somewhat rigid and it was felt that this was a deterrant to the full utilization of his intellectual capacity.

For several years his behavior in general was markedly improved. He was able to return to school, he was socially moderately adaptable, and his mother was able to take him on a tour of Europe. Before operation none of these things would have been possible.

In our visit to his home, about thirteen years after onset of symptoms and six years since lobotomy, we found that the patient's appearance was neat and his speech distinct. He spoke in a high-pitched voice with a slight lisp and his delivery was rapid. He stated that he still has his "obedience trouble"; that is, he will do things that he is told without apparently realizing the absurdity of the behavior. His major interest is band music. He plays the clarinet in the high school band and also plays the piano at home. He has no close friends and his schoolmates consider him "odd." He has done well in his senior year in high school, having made all A's the first two-thirds of the year. He spends much time writing lengthy stories, the plots usually concern a boy prodigy who plays in the band and wants to lead the band, but the stories never reach a conclusion because he becomes involved in extremely detailed descriptions of the characters and their relationships.

His mother stated that he still has occasional aggressive temper "flare-ups." These outbursts occur when he feels that his mother has disapproved of his behavior. She is disturbed about his future, feeling that if his aggressive tendencies increase he will have to be institutionalized.

He has plans for the future. He wishes to attend college and major in music. His mother is apprehensive about his ability to adjust to a college atmosphere but is willing to permit a trial.

Case No. 10: Ellen T. was admitted to the psychiatric ward of Duke Hospital in December 1948. She had previously been seen as an out-patient by the orthopedic service for her spasticity. She was born in June 1930, the second of twins, and was completely cyanotic for two hours. She had convulsions on her second day. Previous diagnosis had been cerebral palsy with athetosis and feeble-mindedness resulting from birth injury. She developed slowly but made fairly good emotional adjustment in her family. In early adolescence she recognized her difference from other people and vocalized resentment.

Her presenting complaints at the time of admission to the psychiatric ward dated from ten months prior. She had always been jealous of her twin and this increased when the sister was courted and finally became engaged. The onset of serious mental illness was marked by visual hallucinations of hell, statements that she had damned the Lord, and acute emotional excitement. The patient had made three suicidal attempts prior. Two months prior to admission she began to show alarming agressiveness, anorexia, and sleeplessness.

In the hospital the patient's behavior was characterized by anorexia, crying and temper tantrums in which she became aggressive toward other people, and auditory hallucinations of her mother's voice. She tore her clothing, voided on the floor, and masturbated openly. Three electroshock treatments were given resulting only in transitory relaxation and improved sleep. The physical examination showed the patient to be in good general health with the exception of her generalized spasticity and double athetosis. The oxyencephalogram, electrocardiogram, and routine laboratory studies were within normal limits. The diagnosis was hebephrenic schizophrenia with mental retardation, spasticity, and double athetosis.

In January 1949 at age 18, a complete bilateral prefrontal lobotomy was performed in the coronal suture-sphenoidal ridge plane. Following her operation, she exhibited diminished tension, began to eat well, kept her clothes on, stopped hallucinating, and talked agreeably to ward personnel. Due to emotional and financial difficulties in her home, it was deemed best to transfer her directly to the State Training School at Clinton, South Carolina. She made fairly good adjustment in the training school and also slow but steady progress in schooling. About one year ago, she began to display hostile and aggressive tendencies toward one or two other patients in the hospital.

On our visit to the institution six years after onset of mental illness and five years since lobotomy, we found Ellen to be quite happy and at east. At that time she was currently anticipating a visit to her mother. She has been making periodic week-long visits to her home during the past three years. We were informed that her aggressive behavior of a year ago had abated and that she was no longer special problem in management. Her mother was recently injured in an automobile accident and when Ellen was informed of this she expressel concern but no emotional crisis occurred. She attends church services regularly but shows no preoccupation with religion.

Case No. 11: Linda S. was an apparently normal child, and had developed normally until the age of two and one-half years, when she began to speak indistinctly and less spontaneously. Her speech progressively deteriorated, she began to have screaming spells, and she displayed destructive behavior. She became apathetic and uninterested in her environment. The child was admitted to Duke Hospital for studies at the age of four. Her physical examination was within normal limits, as was the neurological examination, although the electro-

encephalogram showed generalized dysrhythmia, and a diagnosis of post-encephalitic syndrome was entertained. During the ensuing two years Linda's aberrant behavior became more marked until she was practically unmanageable. She was seen again at Duke Hospital in July 1944, at the age of six. A Stanford-Binet test showed her I.Q. to be 34.

Since no recommendation for therapy was made at Duke, the parents took the child to Washington, D.C., where she was seen by Drs. Freeman and Watts at George Washington University. A portion of her history is obtained from their book, *Psychosurgery*, 2nd Ed., 1950, Charles C. Thomas Pub., in which Linda is listed as Case 262 on page 441.

Findings at George Washington University Hospital were essentially as recorded at Duke Hospital, and pneumoencephalography was reported as normal. In August 1944, complete bilateral prefrontal lobotomy was performed in the coronal suture-sphenoidal ridge plane. Her behavior improved somewhat over a two months period but a relapse occurred. A second lobotomy was performed at a plane 15 mm. behind and parallel to that of the first operation.

Following the second operation she became more talkative, less destructive, and more easily managed. When she was last seen in February 1949, she is reported by Watts and Freeman as being "quite withdrawn but less troublesome . . . talked very little and was making no progress in helping in the home." The final impression at George Washington University was "childhood schizophrenia, probably originating before the age of four."

Following the death of her father in 1950, Linda became less manageable and her behavior was characterized by frequent temper tantrums. Since her mother and brother were physically unable to control her in the home she was admitted to Caswell Training School early in 1950. Her I.Q. on admission was 24 (Stanford-Binet). This I.Q. and her behavior placed her in the "untrainable group" and she has since been under simple custodial care. She remains healthy and is able to feed and clothe herself, and is tidy in her toilet habits. She is said to be "no problem except for her rough play." When we saw her we were unable to obtain a verbal response to any of our questions, but she seemed happy in her environment. It was noted by ward personnel that she drinks excessive amounts of water and is seen to urinate frequently.

Case No. 12: Eugene N. was referred to the Duke Psychiatric clinic in 1947 at the age of fourteen. He was born of an unplanned but desired pregnancy. Labor was neither difficult nor prolonged. He sucked his tongue until the age of five years and was eneuritic until the age of ten. There was no history of feeding problems. He is said to have been a happy, enthusiastic, and alert child until the age of six, at about which time he began to grow self-conscious and timid.

Symptoms of his illness were first noted in school, when, at the age of nine, in the third grade he began to cry over trivial school matters. Three years later, his sixth grade teacher reported that he was inattentive and seemed to daydream a lot. This behaviour became progressively more prominent and resulted in his failing the eighth grade. In that, his fourteenth year, he began to have obsessive ideas about germs and dirt, became preoccupied with bodily functions, religion, and sex. Ritualistic behavior and compulsions became manifest at that time. There was no evidence of hallucinosis.

He was admitted to the hospital for the first time in 1947, when the physical examination, the neurological examination, and the routine laboratory studies were within normal limits. The Wechsler-Bellevue I.Q. was 72. There was a wide scatter on the subtests and it was the psychologist's opinion that the low level of function was the result of impaired efficiency, not low-grade intelligence. To the Rorschach Test he gave bizarre responses, and there was stereotypy, emotional impulsivity, perseveration, contamination, flight of ideas, and generally a poor form level. The results were suggestive of a schizophrenic process. On the ward he demonstrated preoccupation with the men's toilet as well as compulsive rituals which consisted of performing various maneuvers for doing so.

He was transferred to a private institution after three weeks, where over a period of several months he improved physically but not mentally. In August 1947, following an episode of catatonic mutism he was given twelve electroshock treatments with some improvement. He was readmitted to Duke Hospital in December 1948 because his behavior at home had become completely unacceptable. He had begun to wander into strange houses and investigate the bathrooms. On one occasion he made sexual advances toward his older sister. At the time of that admission there was grimacing of the forehead and mouth and abrupt manneristic movement of the arms. His speech was halting and repetitious, and he frequently whispered and sometimes appeared to be talking to someone other than the examiner. There was preoccupation with the effects of poisons on the brain, black widow spiders, snakes, and God. The delusion was elicited that his mother was not his real mother, and that the latter was dead. The physical examination, neurological examination, routine examination, the electroencephalogram and the pneumoencephalogram were all within normal limits.

On January 10, 1949, at age 16, he had a bilateral prefrontal lobotomy, the plane of section being 1.5 cm. anterior to the coronal suture line superiorly and in the plane of the coronal suture line inferiorly.

The patient was only moderately improved by this operation. In the first year following lobotomy he had episodes of talking to himself, which had the form of a debate. Following these he sometimes threw chairs around but never attacked another person. The intensity of this behavior subsided gradually. His improvement since that time has been only moderate until one year ago.

Discussion

Although lobotomy is an irrevocable and drastic procedure, our cases were such severe chronic problems that the only alternative to attempted relief of symptoms was custodial institutional care. Our follow-up would seem to have justified the operative procedure. It could have been argued that growth may have accounted for the improvement. However, two or three facts argue against this. 1) Most cases of chronic childhood schizophrenia have not shown improvement. 2) The post-encephalitic cases have not improved. 3) The experience with hemispherectomy has shown that severing of brain connections has brought about marked satisfactory reduction or disappearance of behavior disorders even of severe abnormalities of behavior.

Conclusion

Our follow up study of childhood lobotomy 3 years and longer in 12 cases would seem to justify the operation—at least for amelioration of severe behavior difficulties.

Authors' Note: All of the lobotomies, except case #11, were performed by Guy Odom, Professor of Neurosurgery, Duke University School of Medicine.

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Species Resistance to the Development of Atherosclerosis

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As a part of an overall program of fundamental and clinical research on atherosclerosis, the problem of species resistance to this condition was considered. Clinically these patients are of particular concern because of the increasing number of admissions to state mental hospitals with a diagnosis of chronic brain syndrome associated with cerebral arteriosclerosis. Of basic interest are the reports of numerous unsuccessful attempts to produce atherosclerosis in the rat, and the finding that in those in which lipid deposition was accomplished, there was apparently little resemblance to human atherosclerosis.

As pointed out by Wissler[1] there are seemingly a number of advantages in using the rat as an experimental animal in the study of atherosclerosis: the similarity of nutritional requirements to those of man, the short life span, small size and availability, all contribute to its potential experimental value. However, the most interesting consideration in the use of the rat is in overcoming its resistance to the development of atherosclerosis in the hope that an understanding of this resistance may find application in the further clarification of the disease process in humans.

A recent article on a study done in Holland by Hoogerwerf et al.[2,3] reported that a diet rich in cholesterol and vitamin D_3 (activated 7-dehydrocholesterol) would produce atherosclerosis in the rat. They also indicated that Vasolastine (a preparation obtained from the seeds of a mustard plant, crucifer) would prevent or reverse the atherosclerosis produced in rats by these dietary modifications. In view of the resistance of the rat to atherosclerosis, a new method for

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producing it experimentally in this species deserves careful study. The work described herein is an attempt to reproduce the results of Hoogerwerf. These studies are preliminary to a clinical evaluation of the preparation which reportedly mobilizes the cholesterol deposits in atheromatous plaques.

Method

Twenty-four rats were divided into three groups (A, B & C). Groups B and C were fed synthetic diets high in cholesterol as explained in Table I. The food was given ad libitum, and periodic weight checks during the experiment revealed no differences between the groups.

TABLE I

GROUP A—Basal Diet,
GROUP B—Basal diet plus 4% cholesterol* U.S.P.
GROUP C—Basal diet plus 4% cholesterol* U.S.P. plus vitamin D_3.**

*Cholesterol added at the expense of glucose.
**Vitamin D_3 added in corn oil. (6 mg./kg. ration.)

BASAL DIET—70.8% glucose; 18% casein; 5% corn oil; 4% Wesson salt mixture; 2.2% vitamin fortification mixture.

Vitamin Diet Fortification Mixture—A mixture of the following vitamins triturated in glucose (expressed in g./kg. vitamin fortification mixture):

Vitamin A (200,000 u/g) 4.5 g; Vitamin D (400,000 u/g) .25; Alpha tocopherol 5.0 g; Ascorbic acid 45.0 g; Inositol 5.0 g; Choline Choride 75.0 g; Menadione 2.25 g; p-Aminobenzoic Acid 5.0 g; Niacin 4.5 g; Riboflavin 1.0 g; Pyrodoxine hydrochloride 1.0 g; Thiamin hydrochloride 1.0 g; Calcium pantothenate 3.0 g; Biotin 20 mg; Folic acid 90 mg; Vitamin B_{12} 1.35 mg.

Five months later the animals were sacrificed. Total liver lipid was determined by extracting the dried pulverized livers with chloroform for 24 hours using the soxhlet apparatus. The chloroform extract was evaporated to dryness and the residue weighed. Results are presented in Table II. Serum cholesterol values as determined by the method of Zak et al.[4] indicated higher levels in the cholesterol fed groups.

TABLE II

Total Liver Lipid (% of dry wt.)		
Group A	4.3	(3.8- 4.9)
Group B	13.5	(9.7-15.6)
Group C	10.5	(6.9-11.8)

Results

Gross and microscopic examinations of the blood vessels in all groups revealed no evidence of plaque formation. Groups B and C showed typical fatty livers. It is interesting to speculate on the failure of these experiments to reproduce the results of Hoogerwerf. One possible explanation lies in the differences between the diets employed in the two studies. Hoogerwerf employed a commercial rat food to which cholesterol and oil solution of vitamin D_3 (Vigantol) were added. Since these together comprised 9.5 per cent of the ration, the content of one or more essential dietary factors could have been reduced to critically low levels by their addition. Thus Hoogerwerf may have produced a "deficiency state" which when accompanied by a high intake of cholesterol and vitamin D_3 resulted in atherosclerosis. The fact that a diet adequate in all essential nutrients, such as we employed, failed to produce atherosclerosis even though cholesterol and vitamin D_3 were present in concentrations equal to those employed by Hoogerwerf, would lend credence to this view.

Further experiments are in progress in an attempt to repeat Hoogerwerf's observations. A clinical evaluation of Vasolastine is also being undertaken.

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Appraisal of Failures with CO_2 Therapy

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Since carbon dioxide inhalation therapy for different types of neuropsychiatric disorders was first described by Meduna in 1947, a large body of published experiences has appeared in the literature. This should permit some worthwhile appraisal of the problem of treatment failures with this technique. According to Meduna[1] the composite results of different investigators the world over seem to correspond very closely with his own experiences—namely, that about 68% of patients treated by this method show a satisfactory degree of improvement. The range of successful results varied from about 35% to 85%, depending on the type of patients and the skill or enthusiasm or both of the various therapists, but the average was strikingly similar to the overall percentage of Meduna's results. It is my present purpose to investigate some of the causes of failure of improvement in the remaining 30% to 35% of the patients. The analysis is based on office treatment of over 700 patients and a total of approximately 25,000 CO_2 treatments, covering a nine-year period.

Importance of Patient Selection—Clinical Criteria

In general, as in my experience,[2-3] it seems well established that neuroses and psychosomatic afflictions constitute the most favorable group for CO_2 therapy. For the most part, the major psychoses and the severe compulsive obsessive states are refractory to this method of treatment. Whether sociopaths can be helped by the CO_2 treatment remains to be determined, although it would seem that some of their somatization reactions can be favorably influenced. Since the field of neuroses and psychosomatic disorders is tremendously broad, further examination of clinical criteria in these illnesses is in order. One of the paradoxical features of the problem is that patients showing a lot of anxiety are generally suitable for CO_2 treatment but at the same time require the most skillful handling. In some patients who seem clinically suitable the anxiety is of such an explosive quality that the patient may show temporary clinical worsening despite treatment in skilled and experienced hands. Should the treatment be continued despite mounting anxiety in these individuals, there is the danger in an occasional case of a psychotic break. The experienced clinician will of course ordinarily change the treatment before this complication develops. However, in the meantime the patient may become so disturbed by the feelings that are released by the gas treatments that he will prematurely discontinue therapy, thereby bringing about what must be listed as a treatment failure.

A second category of patients who may be difficult to treat with CO_2 therapy are those with rigid character structure. In these patients their emotional conflicts seem to be so deeply buried and the inhibiting defenses seem to be so fixed that the course of therapy may be relatively prolonged. Unless both the patient and the treating physician understand the type of problem involved, the patient tends to become discouraged and to terminate treatment. On the other hand, as Wilcox[4] has pointed out, this degree of rigidity may require a shift to some other form of physiodynamic procedure, such as non-convulsive electrostimulation (ESnc), in order to "break the log jam."

Inflexibility of the Technique of Administering the Gas

In my experience there is considerable variation in the way patients respond to the gas treatment, so that the technique must be varied on a trial and error basis. Some patients show a favorable response to the original Meduna multiple breath technique, using 30% carbon dioxide and 70% oxygen. In other patients this technique produces much anxiety and uncomfortable physical sensations, but when the patient is shifted to nitrous oxide induction he takes the treatment smoothly. Other patients wake from the

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multiple breath procedure, with or without nitrous oxide induction, and still feel tense. In these individuals it is surprising how effective the technique of "after-whiffs" is in reducing or eliminating the residual tension. In general we have developed the rule that when the patient's reaction to the gas treatment is so disturbing to him that he requires some external restraint, then a shift in the procedure must be instituted in order to reduce his unpleasant reaction.

Predictability by the Epinephrine-Mecholyl Test (Funkenstein Test)

In addition to the usual clinical considerations, employment of the Funkenstein test may substantially increase the predictability of the response to CO_2 therapy. For details of the methodology, the theory, and certain ramifications of the test, the reader is referred to a group of references by the Harvard investigators.[5-9] Bhiefly, it may be recalled, that Funkenstein and his co-workers demonstrated that irrespective of diagnosis patients who showed a sustained hypotensive effect following the injection of mecholyl statistically were by far the most favorable for electroconvulsive treatment (ECT), whereas those who compensated or overcompensated for the hypotensive effect of mecholyl showed a poor prognosis with ECT.

Until more recently, however, correlations with other modalities of physiodynamic treatment, especially CO_2 therapy, had not been worked out. In my experience with over 200 patients treated with CO_2 therapy, on whom a Funkenstein test had first been performed, the indications rather clearly stand out. My data, reported elsewhere,[10] indicate that CO_2 therapy and ECT bear a reciprocal relationship to each other, so that patients with autonomic nervous system reaction patterns on the epinephrine-mecholyl test indicating a favorable response for ECT will show an unfavorable response with CO_2 therapy and vice versa. These studies can be summarized as follows:

1. Patients overcompensating for the hypotensive effect of mecholyl, with a rebound of systolic blood pressure above baseline, are the most favorable for CO_2 therapy (Funkenstein's Groups I and IV). Figure I, A.

2. Patients who show an initial hypotensive effect with mecholyl and then return to baseline and level off (Funkenstein's Groups II and III) are often favorable for CO_2 treatment but show a less rapid response. Figure I, B.

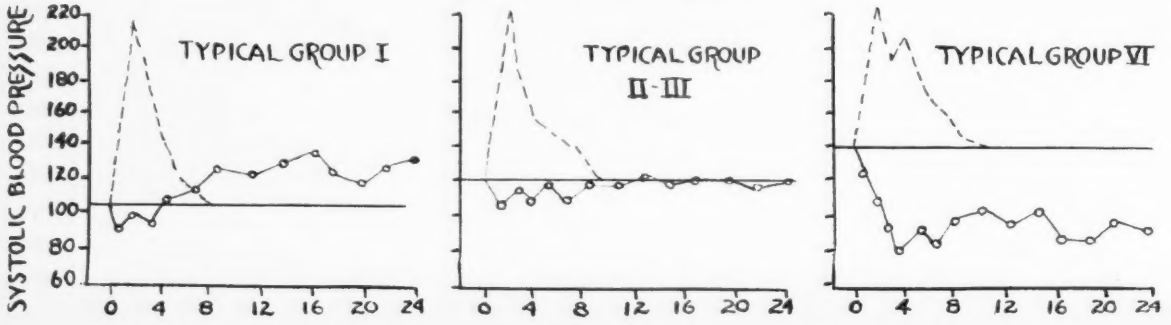
3. Patients who fail to compensate for the hypotensive effect of mecholyl or show a chill (Funkenstein's Groups VI and VII) while favorable for ECT are definitely unfavorable for carbon dioxide inhalation treatment. Figure I, C.

4. In general patients who show anxiety precipitated by the injection of epinephrine are favorable for CO_2 treatments, whereas those showing anxiety precipitated by mecholyl are probably unfavorable. As will be seen from the following illustrative case, these autonomic nervous system reaction patterns may be more significant in predicting the outcome with the gas treatment than are the clinical criteria.

Illustrative Case

M.W., a 38 year old accountant, was referred for psychiatric care because of a fairly well established anxiety neurosis of about 5 years' duration. He had most of the usual symptoms, such as palpitation, cold sweats, fear of fainting, a sense of constric-

Fig. 1. Illustrative Graphs.



tion in the chest, dry mouth, excessive tension in social situations, and a hyperventilation syndrome. As far as could be ascertained clinically, he was not depressed. In addition he had not "decompensated," in that he had maintained a good employment record and had carried on in spite of his symptoms. He had gone to his family doctor for reassurance and sedation and had had a couple of electrocardiograms for further reassurance.

The past history revealed no frank neuropsychiatric breakdown. As nearly as could be estimated clinically, this man was not tremendously handicapped by his illness and seemed to have fairly good "ego strength."

According to usual criteria he seemed to be a favorable candidate for carbon dioxide treatment. This clinical impression was strengthened by three exploratory psychotherapeutic interviews.

However, when the patient was given the Funkenstein test before starting treatment, I was greatly surprised to discover the unsuspected degree of autonomic nervous system imbalance which showed up. Thus he showed anxiety precipitated both by epinephrine and by mecholyl and in addition showed a chill on the mecholyl portion of the test, which lasted from the eleventh to the eighteenth minute. This placed the patient in Funkenstein's Group VII, with anxiety precipitated by both drugs in addition.

Nevertheless, because the clinical indications seemed so clear-cut I started the patient on CO_2 treatment, using the conventional multiple breath technique. I took him only to a very light level of anesthesia, with 22 inhalations of the 30-70 mixture. However, he thrashed about on the couch and after treatment reported that he felt "quite stirred up." He also expressed a strong aversion to the feeling of air-hunger, and felt that he was choking. Accordingly, the next treatment I used nitrous oxide induction, which gave a smoother effect during the going-under phase, but after treatment the patient again stated that he felt stirred up and was bothered by feelings of unreality. He called the next day to report that he felt a sharp increase in his tension and the additional disturbing feature of feelings of unreality. This patient did not return for further therapy and must of course be considered a CO_2 treatment failure. In retrospect, his autonomic nervous system reaction pattern was distinctly unfavorable for this form of therapy, but at that time I did not realize how unfavorable it was.

Later experience has confirmed that patients in Groups VI and VII do not do well with the CO_2 treatment—even though the clinical indications may be favorable. I have treated with less unfavorable results a few patients who showed a tendency towards Group VI, with only a moderate hypotensive effect with mecholyl (and of course without a chill). In these patients, profiting from earlier experience, I have used a mixture of nitrous oxide and 30% carbon dioxide in oxygen—half and half—so as to give an estimated percentage of CO_2 of about 15%. With cautious handling, some of these patients have shown gradual improvement, but it is still my impression that as a group they are unfavorable for any form of CO_2 treatment. Often depression becomes more overt, and a shift to ECT is required for good results.

Correlation of Funkenstein Test and Results of CO_2 Therapy

A previously reported study[10] of a consecutive series of 74 patients given CO_2 therapy after first having had a Funkenstein test revealed interesting correlations as shown in the following tables. When the relationships were subjected to statistical analysis, the significance was found to be high, with "p" being less than .001.

The following detailed break-down of results is shown in Table I.

TABLE I
Results of CO_2 Therapy

Funkenstein Group	Total Patients	"2 Plus" Improvement	"1 Plus" Improvement	"Zero" Improvement	ESnc Required	ECT Required
I	16	11	5	0	2	1
II-III	23	6	14	3	2	3
IV	16	4	10	2	3	0
V	0	—	—	—	—	—
VI	12	0	5	7	4	7
VII	7	0	1	6	0	4
Total	74	21	35	18	11	15

$X^2 = 38.75$; $p < .001$

For simplification the results may be consolidated, so that the Funkenstein groupings are combined according to their neurophysiologic significance and the results of treatment are scored as either "improved" or "not improved," as shown in Table II.

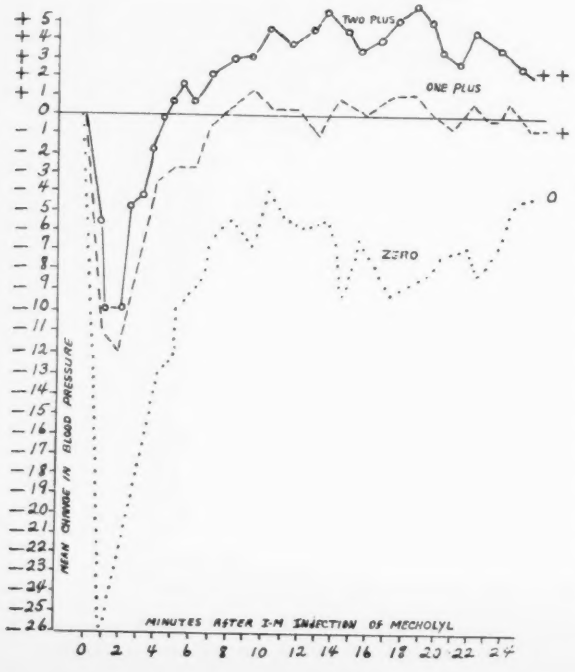
TABLE II
Results of CO_2 Therapy

Funkenstein Group	Total Patients	Improved	Not Improved	ESnc Required	ECT Required
I & IV	32	30	2	5	1
II-III	23	20	3	2	3
VI & VIII	19	6	13	4	11
Total	74	56	18	11	15

$X^2 = 25.12$; $p < .001$

Since the responses described on the Funkenstein test are admittedly grouped in a somewhat arbitrary way and since in an individual case classification may be difficult, it was decided to determine the mean curves of all the actual systolic blood pressure readings on the mecholyl portion of the test, separated into three groups based on the clinical classification of improvement following CO_2 therapy—namely, "2 plus" improvement, "1 plus" improvement, and "zero" respectively. Then the curves were superimposed, starting out with zero as the baseline, so that deviations above and below baseline could be readily compared at each time interval during the 25 minutes of the test. Inspection and analysis of the mean reaction curves (see graph) reveal that with the number of patients involved the curves are not significantly different as to shape. Therefore, the only question to be determined is whether the levels of these curves are significantly different. Using a method suggested by E. F. Lindquist,[11] it was found by analysis by "t" tests that the levels of the three differed markedly. As between the "1 plus" group and the "zero" group "p" is less than .001. As between the "plus" group and the "2 plus" group "p" is less than .01. Even more marked differences of course exist between the "zero" group and the "2 plus" group.

Graph of Mean Curves of B.P. Responses Correlation of Results of CO_2 Therapy and Mean Curves of B.P. Changes.



Psychotherapy Accompanying CO_2 Therapy

To sum up briefly, it would seem that quite a few of the failures reported by different therapists would indicate that either insufficient psychotherapy or an inappropriate form has been administered along with the gas treatment. It should be obvious that this form of physiodynamic therapy mobilizes repressed feelings much more rapidly (and sometimes more explosively) than psychotherapy alone. Successful therapeutic management may depend on proper use of supportive psychotherapy, to tide the patient over the rough spots, so to speak.

In other cases, a more probing type of psychotherapy may be useful to overcome rut mechanisms—that is, reaction patterns which tend to repeat themselves over and over with each gas treatment. The psychopenetration techniques of Wilcox are useful in this respect, as are other drastically modified forms of analytic psychotherapy. The amount of psychotherapy that is required varies tremendously from one individual case to another, and it also partly depends on the physician's orientation.

The Anxiety of the Therapist

From my teaching experience with resident psychiatrists at the Veterans Hospital learning CO_2 treatment and from my discussions with more experienced therapists in the field, I have derived the impression that some of the less successful outcomes with this form of treatment have resulted from anxiety and uncertainty on the part of the treating physician. When the gas treatment mobilizes highly unpleasant feelings, the physician automatically tends to feel impelled to allay the anxiety as quickly as possible. Or if the patient shows a rage reaction and/or comes out with strongly hostile feelings towards the physician, such may pose a problem for the latter as well as for the patient.

Part of this difficulty can of course be resolved by the physician's acquiring greater experience with the administration of the

treatment and with all the modifications designed to reduce the explosive quality of some of the abreactions. On the other hand, it seems to me that in some cases the physician views the CO_2 treatment, whether consciously or unconsciously, as a rather magical technique of which both he and the patient are in some awe. In any event, some personal experience with CO_2 therapy administered by a competent physician may be very useful in resolving the anxiety of the neophyte in the giving of this relatively new modality of psychiatric treatment. After the psychiatrist learning the treatment has experienced many of the different subjective reaction himself, he is in a much better position to deal with them in his patients and to explain meaningfully the type of response that may occur. In passing I should like to point out the contrast between this personal experience for the psychiatrist as contrasted with the diadactic psychoanalysis, in that in the CO_2 treatments indoctrination is absent and suggestion is minimal. His reactions do not depend upon the orientation of his analyst.

Non-Convulsive Electro-Stimulation for Mounting Tension

A final word may be added—namely, that even in those patients that show favorable clinical criteria and a favorable Funkenstein test picture, tension at some stage of the picture may mount to disturbing proportions. This may be handled, as previously described, by a variation of the chemical technique and by appropriate psychotherapy. However, when these measures fail, it is my experience, like Wilcox's, that shifting to non-convulsive electro-cerebral stimulation is of great value. Sometimes 3 or 4 non-convulsive stimulations may break the log jam and permit then a return to CO_2 therapy, with milder reactions subsequently resulting.

Of course if depression rather than mounting anxiety makes its appearance, then the Funkenstein test may be rechecked to see whether the patient has moved into Group VI or VII. In such type of autonomic nervous system reaction, or in the case of a suspected endogenous depression, electroconvulsive therapy may be required at that stage. I treated one patient who had a chronic anxiety state with certain psychosomatic afflictions like severe migraine and dysmenorrhea but also intercurrent periods of depression. On the Funkenstein test she showed a Group I response, with overcompensation to mecholyl, but she also showed anxiety precipitated by both drugs. She started out favorably on the CO_2 treatment as far as the anxiety state was concerned, but 6 weeks later an intercurrent depression required 4 electro-convulsive treatments to clear the barrier. After that she was returned to CO_2 treatment and made a very satisfactory recovery.

Summary

The majority of investigators, including the author, report about 30 to 35% failures with CO_2 therapy. Investigation of a series of 700 patients receiving a total of approximately 25,000 carbon dioxide treatments during the past 9 years reveals certain factors involved in the unsuccessful results.

These include: (1) selection of clinically unsuitable cases, criteria for which are discussed; (2) inflexibility of treatment technique; (3) mishandling of abreactions during and immediately following treatment; and (4) inappropriate forms of concurrent psychotherapy.

Moreover, the epinephrine-mecholyl test (Funkenstein test) has high predictive value. Patients who compensate inadequately to the hypotensive effect of mecholyl (Groups VI and VII) are almost always unsuitable for CO_2 therapy, whatever the clinical indications. Whereas patients who overcompensate to mecholyl and patients who show anxiety precipitated by epinephrine are the most suitable.

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Chronic Patients' Comments about Their Tranquilizing Medication

B. J. BOLIN

The numerous published studies of the effects of the so-called tranquilizing drugs on psychiatric patients have, for the most part, been concerned with behavioral and physiological changes. Priority of these features of the problem has left certain other areas relatively unexplored. Mental patients' subjective reactions to the medication is one of these.

Sarwer-Foner and Ogle,[1] in an intensive, year-long investigation of these drugs, devoted much attention to the subjective effects in question. These investigators report that 14 of their 90 cases illustrate the production of psychosis, of further psychotic disintegration, or of enhanced anxiety during treatment with reserpine and chlorpromazine. They go on to describe the patients' subjective experience and the psychodynamics involved in such experience.

Persons working with mental hospital patients encounter reports ranging from grateful praise for the relief the drugs afford to complaints that the medication causes intense discomfort. So, with the hope of gaining some useful and interesting information, we undertook a survey of the opinions of chronic patients concerning the effects of their medication. Although these opinions are bound to reflect distortions of perception and interpretation, they may be accepted as reflecting the patients' subjective experience, which for them is real. Moreover, psychosis seems seldom to eliminate the ability to discriminate between agreeable and disagreeable states.

The 100 subjects, 52 men and 48 women, had been diagnosed as follows: schizophrenia, 64; chronic brain syndrome, with psychosis, 23; mental deficiency, with psychosis, 7; involutional psychosis, 3; manic-depressive psychosis, 2; and paranoid condition, 1. Their ages ranged from 21 to 76 years, with a mean of 49.9. They had been on hospitalized status an average of 8.7 years since last (present) admission.

For at least three weeks, generally for many months, the patients had been receiving the medication. Of the group 34 were on chlorpromazine, 46 on reserpine, 19 on both of these drugs, and one patient was receiving Frenquel. The daily dose of chlorpromazine ranged from 100 mg. to 500 mg., orally with a mean of 137.5 mg. The reserpine dose ranged from 1 mg. to 8 mg., with an average of 1.8 mg. daily, while 20 mg. was the daily oral dose of Frenquel.

Interviewing the patients individually, we asked the following questions: (a) "How do you feel?"; (b) "Are you taking medicine?"; (c) "How does it make you feel?" and (d) "Would you rather take it or not?" We encouraged amplification of replies as needed by asking such questions as "How do you mean?"

Because many patients attributed both agreeable and disagreeable effects to their medication, we had to evaluate responses as a whole in order properly to decide the predominating sentiment. Patients reporting

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more agreeable than disagreeable effects were counted in the agreeable category, while those reporting more disagreeable than agreeable effects were placed in the opposite category.

In these proportions, the patients reported reactions as follows: (predominantly) agreeable, 31 per cent; disagreeable, 24 per cent; no change, 24 per cent. The remaining 21 patients gave answers too equivocal or too inconsistent to justify placing them in any of the foregoing classes. Patients most often mentioned these as beneficial effects, in order of frequency: reduced nervousness, tenseness, or restlessness; improved sleep; improved bowel function; and improved appetite. In this order, the disagreeable effects mentioned most often were: "drunk" or dizzy; feeling tired, listless, or "droopy"; and motor difficulty.

The numerous pertinent studies document the improvement in ward behavior produced by the drugs under consideration. Our data are interesting in that they imply rather frequent disparity between the objective and the subjective effects of the medicication—at least in chronic patients. One source of such disparity of course lies in the psychotic's impairment of perception, judgment, etc. Still, his subjective experience is real for him. Patients reporting no effects may have been so dulled by their illness as to be insensitive to actual changes. Certain patients with awareness of limited remaining capabilities may dislike further curtailment of drive or activity.

Sarwer-Foner and Ogle report that the physiological effects of the drugs—"holding down" the patient, making him feel weak, tired and anergic—resulted in undesirable psychological effects in some of their subjects. They found curtailment of activity to be threatening to these patients, who revealed fear of increased passivity, fear of impaired body functions or body image change, or who interpreted the physiological effects as assault.

One of our schizophrenic patients, formerly almost completely withdrawn and mute, now begs to have the medication discontinued. While now active and communicative (and revealing evidence of her very high original intelligence), she now insists that she is troubled by nervousness, restlessness, insomnia, and various distressing thoughts and sensations. None of these, she maintains, bothered her much before her present treatment.

Evidently, such a patient prefers the greatly curtailed awareness imposed by that kind of psychosis to greater involvement with the world and the psychotic symptoms. The relatively serene state reached by some chronic patients may represent fairly successful or fortunate adaptive changes to the conditions of psychosis. Appreciable alteration of the equilibrium in such patients conceivably could increase rather than decrease discomfort.

Sumzmary

One hundred chronic, hospitalized mental patients gave their impression of the effects of their tranquilizing medication. They reported subjective effects as follows: (predominantly) agreeable, 31 per cent; disagreeable, 24 per cent; no change, 24 per cent, with 21 of the subjects giving reports too equivocal or inconsistent to justify definite classification. These findings and other observations are discussed briefly.

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Effects of Chlorpromazine on the Blood Presure Reactions of Healthy Subjects Following Mecholyl

GEORGE A. BRAY, M.D., and DANIEL H. FUNKENSTEIN, M.D.

Within the last few years many papers have appeared in the literature describing the use of chlorpromazine in the treatment of mental illness.[1,6,7,9,10,11,12] Although there is considerable difference of opinion as to the exact indications for therapy, it is generally agreed that it is more effective in cases in which agitation and tension predominate than in those who are depressed. Moreover, chlorpromazine has even been reported to precipitate depressions when used in apathetic quiet patients.[1,6] Funkenstein et al.[3] have shown that the blood pressure drop following an intramuscular injection of acetyl-beta methylcholine is more prolonged in depressed patients than in psychotic patients without depressive symptoms or in normals. Following recovery from the depression, the response to mecholyl shifts toward normal (i.e., a shorter hypotensive response to mecholyl).

With this in mind, we have investigated the influence of Thorazine on the blood pressure response to an intramuscular injection of mecholyl of healthy subjects. We have simultaneously measured psychological variables in an attempt to correlate psychological and physiological responses.

Methods

Fifteen healthy college students as determined by physical examination served as the subjects for this experiment on a voluntary basis. Their ages ranged from 18-28 with the majority being in their early twenties. They were all enrolled in one of several local colleges.

During the first visit to the laboratory, each subject underwent the following:

1. A routine medical history and physical examination.
2. A battery of psychological tests.
3. A Cold-Pressor test designed to acquaint the subject with the test procedures and apparatus to be used. The procedure consisted of first establishing basal conditions which was accomplished on every visit to the laboratory by having the subject lie quietly on a wooden table for twenty minutes or until his blood pressure and pulse were stable for three consecutive five-minute periods. At this time a baseline reading was taken on the ballistocardiograph. This consisted of a Sanborn light source mounted across the lower legs and a Sanborn photoelectric cell which is recorded on a General Electric DWB cardiograph. After the baseline had been determined, the subject immersed his hand in water at 4° centigrade for one minute while his blood pressure, pulse and ballistocardiogram were taken at thirty-second intervals for the next five minutes.

On subsequent visits the subjects underwent the following:

1. The subject was rested on a wooden table until basal conditions of blood pressure were achieved and then a ballistocardiogram was taken.
2. An intramuscular injection of mecholyl (10 mgm) was given. Blood pressure, pulse, and ballistocardiogram were recorded every thirty seconds for five minutes and then every two or three minutes until the blood pressure had returned to the baseline.
3. Thirty minutes after the initial injection of mecholyl either a placebo or 50 mgm of Thorazine (identical tablets) was given to the subject by mouth with water. During the next hour he rested on the table.
4. Following an hour to allow absorption, the injection of mecholyl was repeated and blood pressure, pulse and ballistocardiogram recorded in the same manner as before the tablet.

The hypotensive response to mecholyl was graphed in such a way that one sheet of paper contained the responses on the day when the placebo was given and the other sheet the responses on the day when the Thorazine was given.

From the Department of Psychiatry, Harvard Medical School and the Massachusetts Mental Health Center.

Results

The following graphs show the results of a typical experiment (Figure 1):

The differences in area, maximum fall and duration of time required for the systolic blood pressure to return to the presystolic level were all measured and then converted into percentages of change over the initial response to mecholyl. These percentage changes and the "t" test for their significance is shown in Table I. It can be seen that both the percentage change in area and time required to return to the baseline are significant whereas the percentage fall is not.

TABLE I

Subject	*% Area*	*% Fall*	*% Time*
1.	— 48	— 97	—100
2.	35	—108	18
3.	33	77	14
4.	206	57	130
5.	55	60	— 15
6.	— 67	29	— 26
7.	380	— 21	140
8.	68	46	— 38
9.	— 18	— 21	— 1
10.	87	25	88
11.	— 14	22	— 3
12.	292	54	— 61
13.	248	61	67
14.	85	— 14	67
15.	130	105	0
	1472	275	688
"t"	2.98	1.17	2.45
P	0.01	Not Significant	0.05

The differences in the Mecholyl blood pressure reaction following a placebo and following 50 mg of Thorazine. For definitions of area, fall and time see Funkenstein, Greenblatt and Solomon.[3]

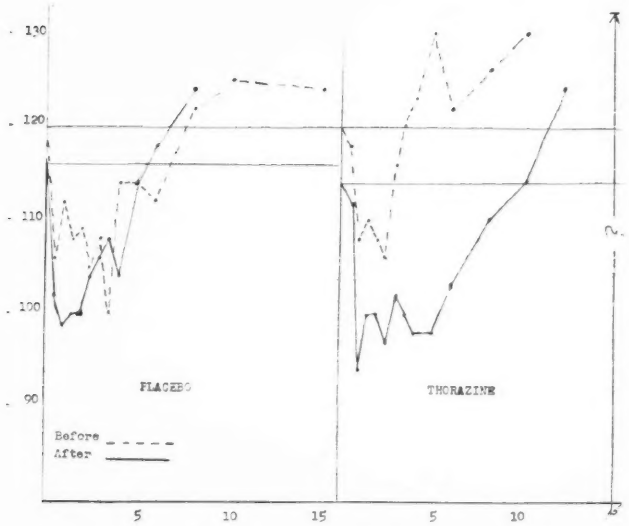

Figure 1. The differences in the Mecholyl blood pressure reaction following a placebo and following 50 mg of Thorazine in a typical case. It can be noted that the blood pressure reaction is essentially the same following the placebo, but following Thorazine there is a significant increase in the "area" under the curve, and the "time" at which the blood pressure returns to the pre-injection level.

Discussion

Any attempt to understand the influence of chlorpromazine upon the hypotensive action of mecholyl requires first of all some understanding of the way in which mecholyl influences the blood pressure. Funkenstein et al.[3,5,8] studied the effect of mecholyl and epinephrine on a number of hospitalized mental patients, and were able to divide the responses into seven groups. In this study of mentally ill patients, a hypotensive response lasting more than 25 minutes was found to have a highly favorable prognosis in response to electroshock therapy (34% improvement with group II-III and 88.8-96.9% improvement for group VI-VII). Subsequent work has been done using mecholyl alone, dividing the patients into two groups. Again there were highly different responses to therapeutic measures. Thus, clinical improvement is more often associated with a prolonged hypotensive response to mecholyl when electroshock therapy is used than when there is only a brief hypotensive response. This prognostic correlation has been recently confirmed by Pasquerelli et al.[7] who find that the significant variable is the response to mecholyl and that the induction of anxiety with epinephrine has less significance.

Subsequent studies by Funkenstein[4,5] have provided some evidence about the mechanism of mecholyl hypotension. Intravenous infusions of epinephrine or nor-epinephrine were given to ten normotensive college males, on successive days. Mecholyl ten milligrams intramuscularly was given after the blood pressure had been raised 25% above its baseline readings and stabilized there. With the epinephrine infusion the hypotensive response to mecholyl lasted more than 25 minutes while with the nor-epinephrine infusion the hypotensive re-

sponse in the same individual was less than 25 minutes. Thus, one explanation for the hypotensive response to mecholyl might be framed in terms of the amount of epinephrine in the circulation. The more epinephrine there is in the circulation, the greater would be the response to mecholyl. Since epinephrine in man comes mainly from the adrenal medulla, this would mean an increase in adrenal activity. Similarly in those individuals in whom the response to mecholyl was only brief, the amount of epinephrine released would be small, or conversely, the amount of nor-epinephrine released through activation of the sympathetic nervous system great.

Recent work from two laboratories has tended to support these conclusions. Elmadjian et al.[2] showed that people in aggressive situations (hockey players) had a highly significant increase in their urinary output of nor-epinephrine while those in anticipatory situations (patients before psychiatric interviews and a hockey coach) had a significantly greater rise in epinephrine than in nor-epinephrine. Thus urinary levels of epinephrine and nor-epinephrine can be correlated with psychological reaction of the individual. Zuidema et al.[12] studied nor-epinephrine and epinephrine excretion after giving subjects methacholine and subjecting them to gravitational influences in the human centrifuge. Those individuals who had a prolonged hypotensive response to mecholyl showed marked increases in their urinary epinephrine following the test as compared with those who had only a brief response to mecholyl. The group with the slight hypotensive or hypertensive response to mecholyl, on the other hand, showed an increase in the nor-epinephrine fraction in their urine following the test. In the body centrifuge, those with the highest blackout tolerance had the greatest increases in nor-epinephrine in their urine. From this the authors concluded that the ability to withstand cardiovascular stress depends primarily upon the amount of circulating nor-epinephrine.

Gellhorn[6] has reported a number of studies on the action of mecholyl in cats. He has found that the rate at which the blood pressure returns to the baseline after giving mecholyl is dependent on the response of the sympathetic nervous system. He does this by measuring the changes in blood pressure and the simultaneous contraction of the nictitating membrance. Tetraethyl ammonium chloride, a ganglionic blocking agent, prolongs the hypotensive response to mecholyl, and blocks contraction of the nictitating membrane. Similarly it was shown that lowering the level of barbiturate anesthesia or coagulating the posterior hypothalamus, both of which are methods of destroying the sympathetic centers in the hypothalamus, prolonged the hypotensive effect of mecholyl. On the other hand, strychnine or electrical stimulation of the hypothalamus increases the hypertensive rebound phenomenon after rapid blood pressure drop with mecholyl. From this work, the importance of the sympathetic nervous system and nor-epinephrine have been defined, but the role of the adrenal is less well defined.

Perrera[9] in 1945 reported that five Addisonian patients had a much greater hypotensive response to mecholyl than did a normal group of ten individuals. There is no notation in this work, however, of the duration of the fall which is the principal variable measured in the studies discussed above. Nonetheless, this work needs reinvestigating to clearly define the role of the adrenal medulla in the response to mecholyl.

The problem of formulating the effect of Thorazine on the hypotensive response to mecholyl is a difficult one. Studies on the way in which Thorazine and the other tranquilizing drugs affect the central autonomic nervous system will undoubtedly shed light on this problem. On the basis of the work reported in this paper, the following picture may be drawn. Thorazine prolongs the hypotensive response to mecholyl. A similar response is obtained by giving an intravenous infusion of epinephrine in humans and by depressing the hypothalamic sympathetic centers in cats. Similarly Thorazine is known to be a partial adrenergic blocking agent and thus to decrease sympathetic tone peripherally. One might therefore suspect that Thorazine inhibits the reactivity of the central sympathetic nervous system thus allowing a relative predominance of the parasympathetic-epinephrine releasing centers.

However, on the basis of current information it is also equally possible that Thorazine might increase the reactivity of the parasympathetic epinephrine releasing centers. Only further study will allow one to differentiate.

Summary and Conclusions

1. The effect of Thorazine on the hypotensive response to mecholyl has been studied in 15 healthy college males.

2. Thorazine has been found to significantly increase the hypotensive response to mecholyl as compared with a placebo. The relation of this observation to other facts about mecholyl has been discussed and a tentative explanation offered.

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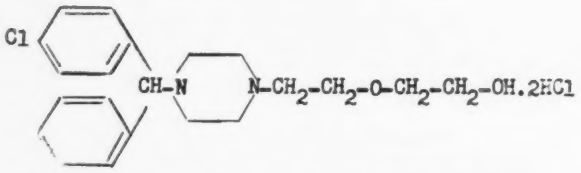
Use of Hydroxyzine in Neuropsychiatric States

(A Preliminary Report)

LEON M. SIMMS, M.D.

Introduction

A number of articles[1-7] have appeared recently reporting numerous clinical applications of hydroxyzine, a substance with the chemical structural formula shown below.



Hydroxyzine hydrochloride. Systematic Chemical Name: 1-(p-chlorobenzyhydryl)-4-2-(2-hydroxyethoxy) ethyl diethylenediamine dihydrochloride.

The primary pharmacological and medical interest in this compound centers around its ataraxic action. It appears to act uniquely in the promotion of a state of tranquility and peace of mind without concomitant loss of mental acuity and awareness. It is reported to remove excessiveness of reactivity.[2] Its action allows emotionally disturbed individuals to recognize the stimuli or sources of the disturbance, to view them with objectivity, and to react to them in a normal, balanced manner. A description such as that just given for hydroxyzine will be recognized likewise as the description of a drug which should prove useful as an adjunct to psychotherapy: that is, in the psychiatric treatment of selected cases exhibiting any of the numerous symptoms or groups of symptoms characteristic of disturbed emotional states.

The successes reported by other clinicians[1-7] with hydroxyzine in the treatment of a variety of conditions for patients of all ages prompted us to test the drug as an adjunct in the psychotherapy of neuropsychiatric patients.

Methods

Our usual dosage in the present study was 25 to 50 mg. t.i.d. This level was used frequently in previous studies and shown to be free of toxic symptoms, even upon continued usage for several months. In some cases 10 mg. t.i.d. was the initial dosage, but usually was found insufficient.

A total of 74 patients have been treated with hydroxyzine. All were adult patients seen in private psychiatric practice. The hydroxyzine therapy upon such selected patients was begun in August 1956; of the 74 treated, 40 currently remain under therapy. All of the patients received psychotherapy concurrently with medication. All types of complaints given by the patients are listed in Table 1. They are of the same general nature as those listed in a previous study.[8] All of the patients selected for trial therapy fit into one of the seven categories listed in Table 2.

Results

The clinical effectiveness of hydroxyzine was of the same order as that seen for several of the other ataraxic substances. Especially in the treatment of obsessive compulsives the effectiveness of hydroxyzine appeared to be definitely superior. Such patients showed greater improvement than that seen from the use of previous ataraxic medications.

Table 2 presents a summary of the results obtained from the use of hydroxyzine as an adjunct to psychotherapy. It may be seen that treatment of anxiety reaction, anxiety hysteria, obsessive compulsive syndrome, and alcoholism has yielded excellent results. Results with depressives, schizophrenic and manic depressives were unsatisfactory. The excellent results obtained with obsessive compulsives are illustrated by the three case histories given below.

Case Histories

Case #1—M.Z., a 39 year old white female first seen March 1947, complained of anxiety, insomnia, anorexia and domestic incompatibility. This patient had developed symptom complexes such as compulsive hand-washing, compulsive inspection and rejection of all foods, and a compulsive inspection of all clothes before putting them on, to the point where any suggestion of hospitalization and em-

TABLE 1

Symptoms Listed by Patients

Nervousness	Tremulousness
Anxiety	Palpitations
Insomnia	Intense Fear
Restlessness	Fatigue
Moodiness and Irritability	Inability to work
Gastrointestinal disturbances (belching, nausea, indigestion, diarrhea)	Depression
	Dizziness
	Alcoholism
Headache	Psychosomatic (bodily aches and pains)

TABLE 2

Results of Hydroxyzine Therapy

Diagnosis	Excellent	Good	Moderate	Poor	Total
Anxiety Reaction	12	2	2	2	18
Anxiety Hysteria	16	2	3	3	24
Obsessive Compulsive	6	2	2	3	13
Depressive	0	2	2	4	8
Alcoholism	2	0	0	0	2
Schizophrenic	0	0	0	5	5
Manic Depressive	0	0	0	4	4
					74

ployment of physical therapies such as electroshock or insulin was rejected. She had always refused to take any medication. In August 1956, her mother, upon whom she had been hopelessly dependent, became ill with a coronary occlusion and for the first time she agreed to drug therapy. She was placed on hydroxyzine, 25 mg. q.i.d. and has remained on it ever since. Although her mother has improved and assumed many home functions, the anxiety of the patient has decreased, her ritualistic compulsive acts have diminished and living with her has become more tolerable. She is now able to do the home shopping, goes out alone, and shows a greater ability to socialize with neighbors. The patient has been on hydroxyzine for 9 months.

Case #2—J.H., a 30 year old white male married and employed as a clerk, was first seen in August 1956 because of severe anxiety, insomnia and a compulsive pre-occupation with suicidal fantasies. He had been a severe stutterer since age 8 and since age 19 had obtained some solace in heavy drinking. The patient was placed on hydroxyzine in gradually increasing doses until he was receiving 50 mg. t.i.d. He showed marked evidence of anxiety at the beginning, but then became progressively less anxious, less pre-occupied with his suicidal fantasies, and was able to reestablish satisfactory relationships at home. He continued his job during the entire treatment program, and his job efficiency and feeling of security have increased. His stuttering has also shown marked improvement.

Case #3—M.G., a 55 year old white female was first seen in February 1956 following a course of electroshock therapy which had been given because of severe depressive reaction associated with suicidal ideas. When first seen, the patient complained of acute distress associated with obsessive frightening thoughts which were associated with the "truth." She related every incident which occurred back to other incidents and conversations with people, and would then decide whether or not they were telling her the truth. Marked fear of losing her mind, anxiety, irritability, insomnia and anorexia were present. The patient was given hydroxyzine in August 1956 and was seen weekly for supportive psychotherapy. She was urged to work with her husband in an office, at which job she has been able to continue. There was marked lessening of anxiety and distress and improvement in relating her associations with people concerning the "truth." She has carried on with her job throughout the course of treatment and is still being seen on a regular basis for psychotherapy and medication, which is given in doses of 25 mg. q.i.d.

Discussion

A striking feature noted in the present study of hydroxyzine concerned its efficacy in the treatment of patients with obsessive compulsive reactions. Very favorable results were obtained in all thirteen cases treated in this study, including three cases of obesity where compulsive eating was of importance. These patients apparently were able to follow their diets and to lose weight without giving up early in the course of a rigorous dietary regimen. Based on experience with previous drugs, the results obtained with hydroxyzine in the obsessive compulsives represent a marked advance.

An improvement was noted in many of the psychosomatic symptoms such as epigastric distress, headaches, feelings of tension, anorexia and insomnia. The excellent results found in treating anxiety reactions include a number of varied syndromes characteristic of such conditions. Three patients with anxiety hysteria who showed improvement in their mental condition were homosexuals. Two cases of anorexia nervosa were included in the test patients. Both showed improvement wherein their constant feeling of nausea was ameliorated. The depressives, schizophrenics and manic depressives showed little or no change. The manic depressives, all of whom were in depressive phases, showed no improvement at all. These results agree with those of Ende,[3] who found poor results

with hydroxyzine in the treatment of patients diagnosed as suffering from melancholia and those classed as depressives.

No serious side effects or drug idiosyncrasies were noted in the 74 patients. There was no report of weakness or fatigue, no vertigo, no dermatitis, nasal congestion or cardiovascular side effects. Headaches were noted early in the treatment of six patients, but they were transient in nature and occurred only in the first two weeks of treatment. No one complained of motor restlessness or visual disturbances, and all patients who drove cars continued to do so without difficulty. There was no depression of appetite; in fact, a majority of the patients reported an improved appetite. Those patients who had listed insomnia as one of their symptoms (Table 1) uniformly showed marked improvement in this respect within two or three weeks. Twenty patients noted a mild dryness of the mouth; however, the symptom did not last nor was it in any case sufficiently marked to necessitate cessation of drug therapy. It is important to note that there were no symptoms of depersonalization or feelings of unreality noted by any of the patients as a result of hydroxyzine therapy. No interference with normal mental acuity was noted in any of the patients. All patients were ambulatory and those employed were able to continue their work during the treatment period.

Summary

Excellent results were obtained in 74 patients when hydroxyzine was administered as an adjunct in the psychiatric treatment of anxiety reactions, anxiety hysteria, obsessive compulsive reactions and alcoholism. Especially gratifying results were obtained in the treatment of obsessive compulsives who frequently in the past had proven to be refractory to other modes of therapy.

These findings concur with those of other workers that hydroxyzine is not suitable for the therapy of depressed states nor for the numerous manifestations of schizophrenia.

No side reactions of sufficient magnitude to warrant cessation of therapy were encountered. The value of hydroxyzine lies in its amelioration of anxiety and tension without overtly or adversely affecting the autonomic nervous system. Patients receiving hydroxyzine (Atarax) became tractable and amenable to psychotherapy, since their mental faculties were in some instances restored and in no instance impaired.

Author's Note: Hydroxyzine used in this study is manufactured by Chas. Pfizer & Co., Inc., under the tradename Atarax.

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Proceedings of Eastern Psychiatric Research Association, Inc.*

A DRAWING COMPLETION TEST

(An Interpretation of the Unconscious by a Projective Technique)

FERRUCCIO DI CORI, M.D.

Freud's fundamental discovery is that many psychological functions of life may be understood and made accessible only if their unconscious motivation is brought to the surface through a process of reconstruction. This unconscious process is usually expressed through dreams, children's play, fantasy, or neurotic and psychotic symptoms. At a primitive preverbal level the process becomes repressed during an incomplete maturation and, therefore, brings apparent disharmony to an ill fitted personality.

Projective techniques have been, during the last twenty years, a proving ground through which many aspects of the dynamics of the unconscious have found their proper investigation and solution. Projection, according to a Freudian concept, is a mechanism of defense. According to more recent concepts, it signifies all the reactions, expressions, feelings that the individual projects outside of himself. Thus projective technique deals with several aspects of one's personality, although it is the staff bearer of deep-seated drives.

In this paper I present a test of a projective technique based on a drawing completion rationale which I found of interest, besides being an auxiliary weapon for diagnostic and therapeutic guidance.

Administration of the Test

The administration of the test consists of giving the subject a blank sheet on which six boxes of the same size are ruled. The first one labeled "Ego" contains a small dot in the upper left corner. The second box, "What I would like to do," is completely blank. The third, "Home," has a small rectangular box drawn in the right lower corner. In the fourth entitled "Friendship" two parallel lines are drawn in the upper left and right lower half. In the fifth box, "Stability," a wavy line appears in the lower half; and in the last one, "Sex," two lines are noticeable in the lower right corner, the outer slightly longer than the inner one.

The patient is asked if he understands the meaning of the titles written on the margin of each of the squares. If necessary, interpretation of the captions is made: i.e., ego is defined as "ego is yourself"; stability as "steadiness, firmness, balance," etc.

The patient is then asked to draw into each box an object which refers to the titles, and he is told:

A. That this is not a drawing test, therefore, no artistic ability is required.

B. That "the drawing is completely free." The subject is informed that the drawing can be expressed and completed at any level of approach the performer chooses (abstract, concrete, stylized, etc.)

C. That each drawing, however, must include whatever mark is already found in the box.

D. No time limit is set.

If resistance is encountered, the patient is asked to repeat aloud the instructions given, to prove that he has thoroughly understood the technique which he is to follow.

Rationale of the Test

The rationale of the test is based on the fact that the patient is confronted with a sequence of six boxes which appear, at first glance, to be practically empty. The upper center box "what I would

DIAGRAM 1

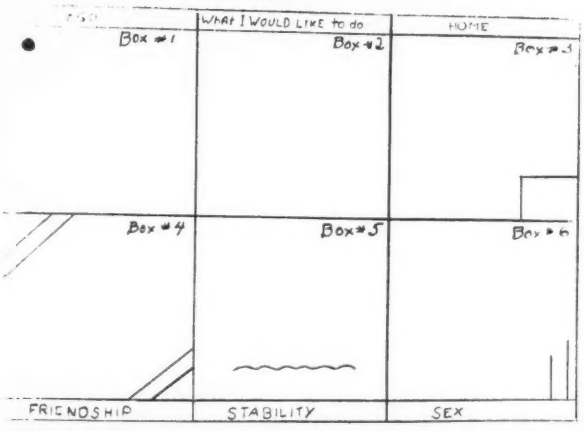
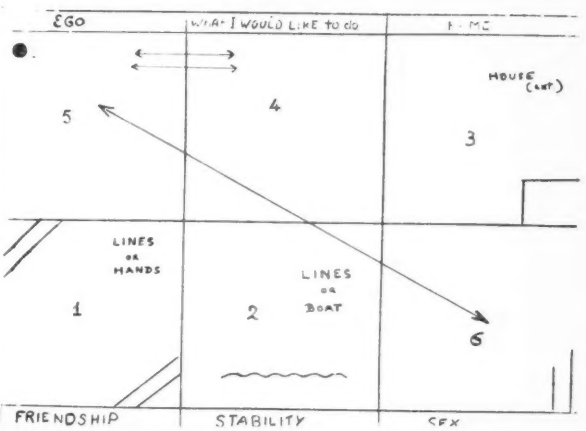


DIAGRAM 2



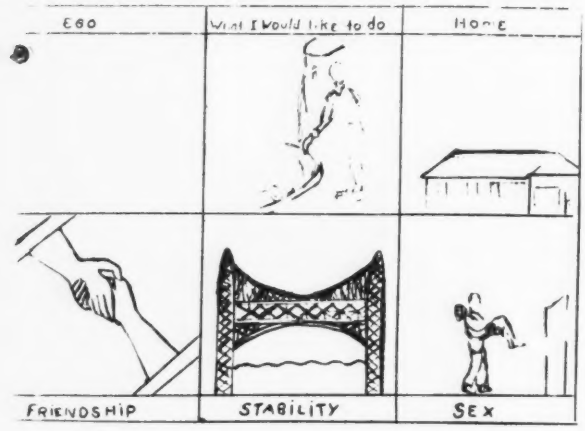
*Meeting of Feb. 6, 1957, held at New York University Medical School.

like to do" represents, at first, a wide empty space into which the patient can express anything he wishes. On either side: the "ego" on the left, and "home" on the right represent "mild" stress stimuli which, to a certain extent, should coerce the patient either to express himself openly or to withdraw.

In the No. 1 box (ego) the dot at the upper left is intended to represent an abstract concept of the ego placed as high as possible and still kept within limitations. A similar provocative stimulus is found in box No. 3 where "home" is either a "box in which to seek refuge" or a base from which to expand into a more satisfactory concept.

In box No. 4 (friendship) a limitation is established by the double line at the margins of the square: from both sides the meaning is: help might come if you seek it and it will be given. The con-

DIAGRAM 3



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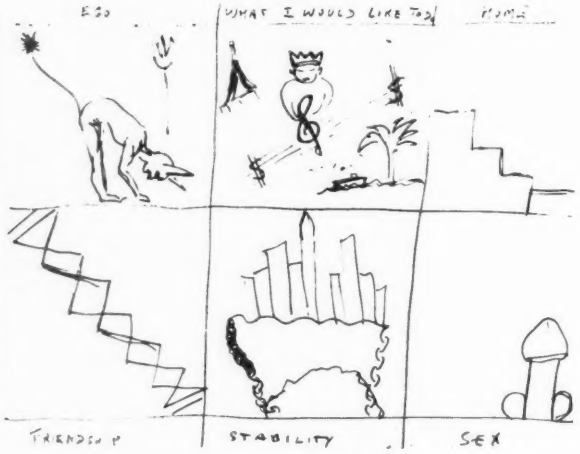
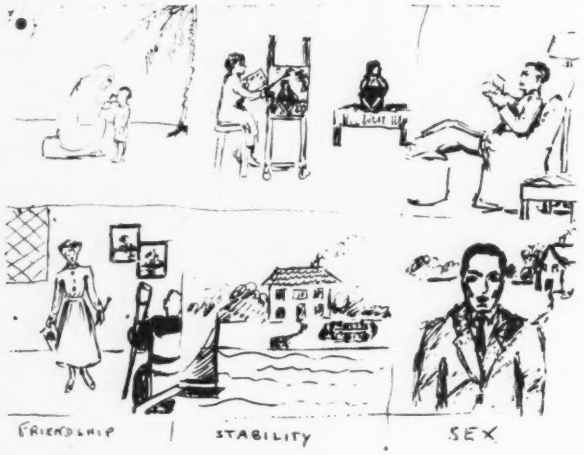


DIAGRAM 5



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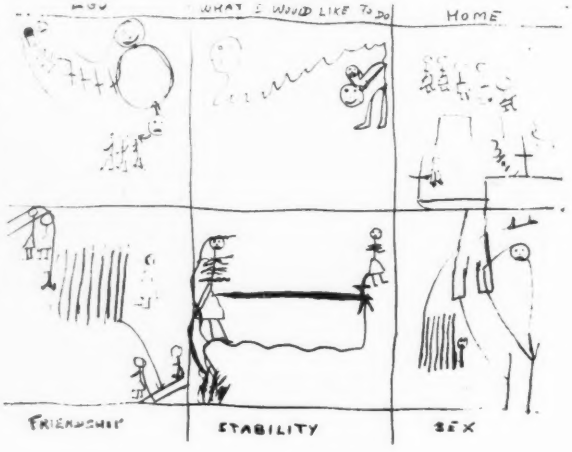


DIAGRAM 7

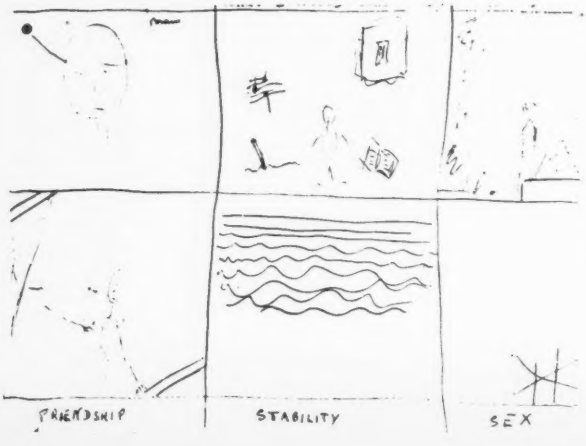
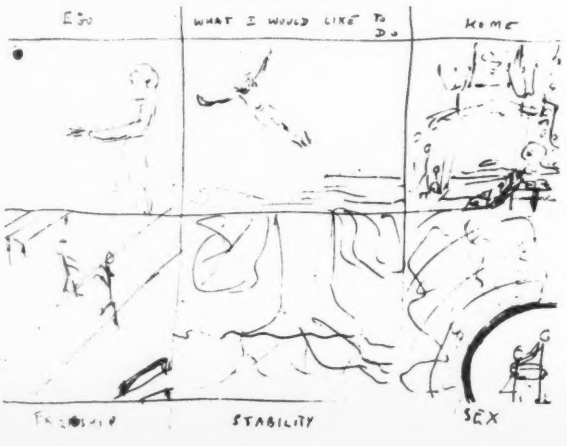


DIAGRAM 8



cept of "stability" (box No. 5) is purportedly expressed by a wavy line in which the curve is only slightly accentuated but "upsetting" enough to produce, at times, a feeling of instability. The last square (box No. 6—sex) is intended to suggest in the simplest schematic fashion, a concept of "male and female." Once the test is completed the patient is asked to elaborate and explain the concept expressed by his drawings.

Clinical Material

Of 150 patients who have taken this test 78% were classified as psychoneurosis (anxiety, character neurosis, situational reactions, homosexuality, obsessive compulsive, etc.) and 22% as schizophrenic or schizo-affective disorders.

The following are illustrative cases:

Diagram 1. Form of drawing test.

Diagram 2. Frequency with which similar re-

DIAGRAM 9

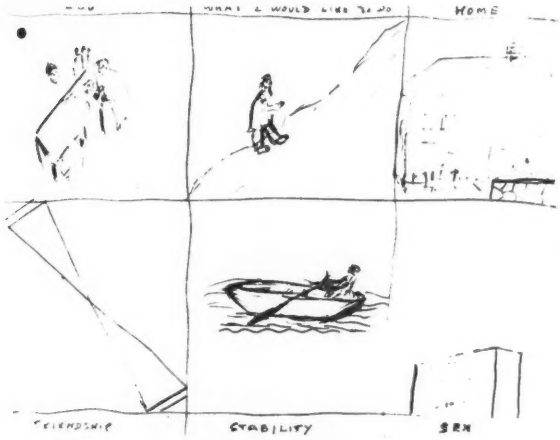


DIAGRAM 10

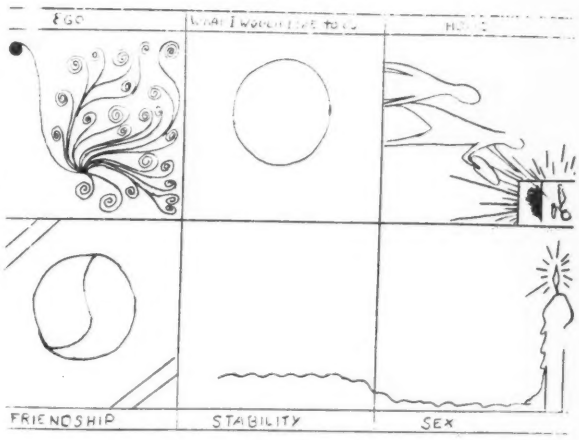


DIAGRAM 11

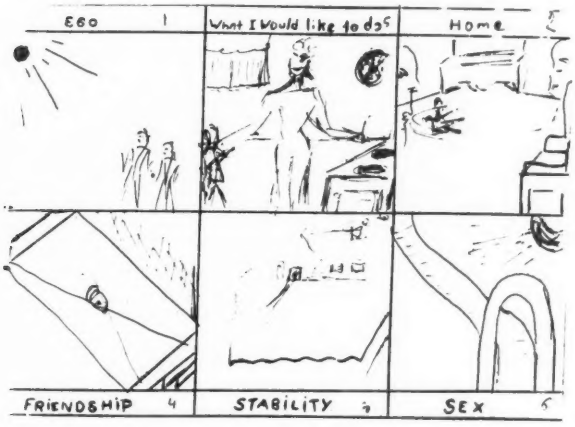


DIAGRAM 12

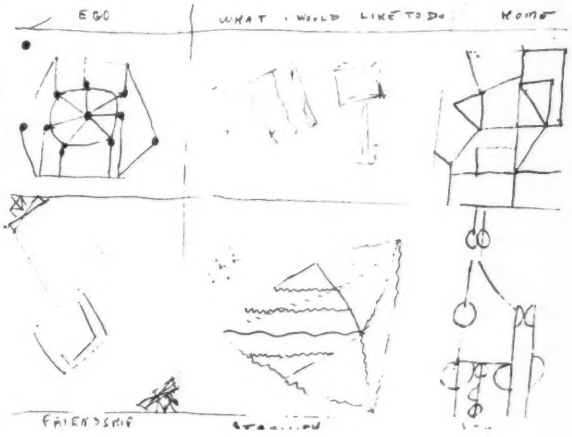


DIAGRAM 13

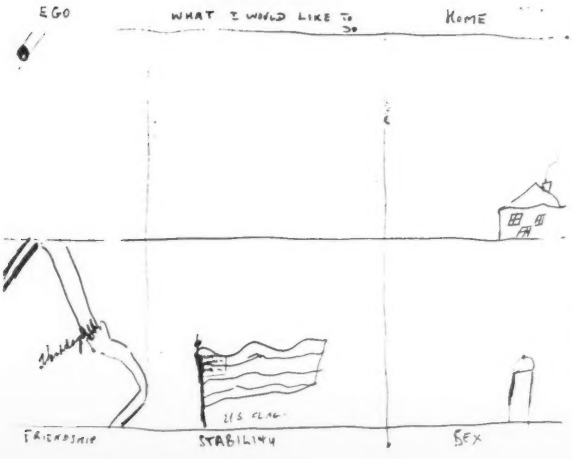
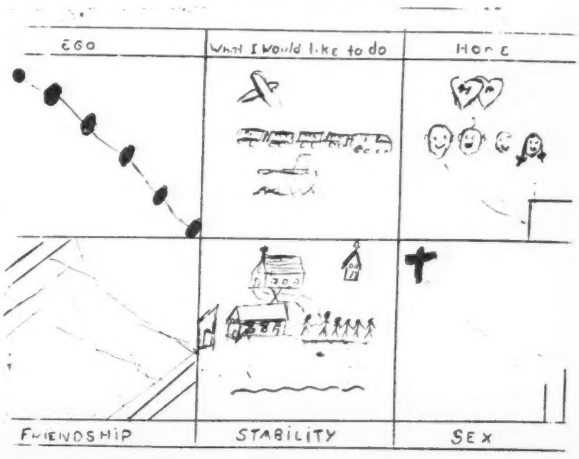


DIAGRAM 14



sponses are made. For instance the box "friendship" is characterized by hands or lines across in the greatest number of subjects. The box "sex" shows the least similarity and the greatest variety of responses. The arrows indicate a seeming correlation of constricted ego expression most commonly associated with a meager or constricted sexual drawing.

Diagram 3. A latent homosexual, age 28; one isolated overt experience in his early twenties; his foremost concept shows that his conscious appreciation of sexual drive suggests a normal desire to carry a woman into a room for love making. This appears in sharp contrast with the implication suggested in the box "What I would like to do"; namely to insert his hose into the rear end of an automobile.

Diagram 4. A talented musician with overt homosexual trends and with manifest manifold phallic worship.

Diagram 5. A 50 year old woman with history of previous psychotic episodes. No particular concern for the content of the individual drawing. The overall execution of the test suggests great need to control, to hold things within bounds.

Diagram 6. A middle age professional woman whose drawings suggest schizophrenic dissociation.

Diagrams 7 & 8. (Husband and wife.) Concern a couple who came to seek advice because of marital difficulties.

His "ego" drawing would suggest a preoccupation with self and intellect. Her "ego" is a bouncing ball suggesting some kind of impact with another object.

In Box No. 2 his sketch shows an artistic interest in art and literature. Hers is exhibitionistic, seeking admiration.

In Box No. 3 his major concern is protection from the outside world by a moat; hers shows an infinitely more conventional idea of home and hearth.

In Box No. 4 his verbalization is "I want to keep friendship in its place and not have intrusion on my privacy." Her verbalization: "Two people who were alone. They are not connected, but they are not alone anymore."

In Box No. 5—his verbalization: "Present status reaching more and more calmness." Her verbalization: "A big tree."

In Box No. 6 there are completely opposite views in this field.

Diagram 9. A 50 year old man who considers his sexuality dead but still likes to climb the highest mountains.

Diagram 10. An artist who at one level jests with the test but who reveals nonetheless paucity of human contacts and underlying sexual preoccupations.

Diagram 11. A 30 year old lady, formerly a model with theatrical aspirations whose narcissistic and exhibitionistic qualities are shown in Boxes 1, 2 and 3. Secrecy in relation with the world (Box 4), sublimation in sex (Box 6): "Sex is a stairway to heaven."

Diagram 12. A professional man with homosexual inclination shows complete inability to express human figures. The entire test is expressed in "introverted" abstract form.

Diagram 13. Meagerness of responses and suggestion of complete lack of inner confidence portrayed by the American flag as symbol of stability reinforced by complete blank in Box 2.

Diagram 14. Inability to express ego strength. Ultimate goal is the approval of authority in a sublimated concept of sex.

Interpretation

When the therapist interprets the test he must take into account: age, sex, educational level, social milieu, intelligence ratio and finally the sequence of performance. Because of the projective nature of this test the patient is bound to reveal himself, and, so to speak, to acknowledge his personality both from the point of view of structure as well as of content.

The analysis of ego (Box No. 1) reveals the ability of the individual to visualize introspectively his own personality; in his drawing the patient may expand and elaborate on the dot, by drawing out of it, thereby giving expression to his aggressions, ambitions, independence, etc.; or, by limiting his drawing to a very restricted area, he might reveal an ego, protected from danger, dissolved or non existent.

The second boxx discloses in terms of previous "ego strength" the patient's unconscious inner wishes or frustrations projected in the social milieu. At times, there is a definitive rapport, or, better still, an interchange of "expressed emotion" between the first and second box. It is in this box that we find almost 50% of our subjects expressing their "rue desire" of reality accomplishment and 50% who describe "what I would like to do" only in terms of flight from danger; running away as a safety measure (drawing boats, airplanes, etc.)

The expression "home" (Box No. 3) allows an analysis of the concept of security, primarily, the patient's own maturity; i.e. "home" still maintained as an expression of protective environment or as an accomplished settlement of an already achieved maturity.

Friendship (Box No. 4) is relatively easy. A large group of subjects expresses it in terms of social structure: "Hands across the sea." Most of the protocols, here reveal a common pattern of expression: either drawings like handshake, people facing each other, or going toward each other, or equivalent symbols like lines drawn across the square.

The concept of "stability" (Box No. 5) compells the subject either to enclose the challenging wavy pattern or to give freedom of space to it by interpreting the caption in the concrete abstraction of a ship floating on water or similar symbolism.

In Box No. 6 (sex) the drawings are, as it might be expected, quite challenging. They reveal most of the conflict and to a certain extent show a direct rapport, as far as a drawing can tell, with the "ego" structure. The deviation in the field of sexuality or the total expression of a repressed wish fulfillment is here more evident than in any other drawing. Most of the resistance, the blocking, the defenses, misinterpretations and frustrations, occur in this box.

In some cases the patient is able to manifest a certain insight into the nature of his inner conflicts.

This test is still somewhat primitive. I have found that the content of the drawings, their emotional connotations, the limitations and the ability of the patient to express himself are important ele-

ments which can be used by the psychiatrist in his study of personality.

My main findings, thus far, are divided into three areas:

Content—The inability of the patient to make any response at all. The tendency to repeat responses. The limited interpretation of responses, or a non-productive interpretation or a "senseless" meaning.

Form—Avoidance or use of space. Shape and pattern of figures. Quality and modality of strokes, or lines, pressure, etc.

Dynamic Interpretation—With this test there is the possibility of bringing to the surface structural elements of personality and unconscious needs and drives which often are not revealed through ordinary verbalization. Fantasy-dream situations, mechanisms of repression, rationalized impulses, aggressive motivations, sex in its development, content and maturity level can be more easily interpreted and evaluated. The verbalized elaboration of his drawings by the patient helps greatly in the evaluation of the dynamics of his conflicts.

This procedure is a test of symbols and their analysis. Symbolism and its interpretation are powerful pillars in the study of human personality which is not "the growth of a human being in a vacuum. Neither is it solely an expression of a biological entity determined by physical environment, but it is the total product of that, plus family environment, plus cultural and social influence of the group in which this particular human being has been reared." It is then valid in the study of personality formation to adopt the concept of Kluckhohn: "Every man is in certain respects:

Like all other men
Like some other men
Like no other man."

The very fact that we create with our minds requires psychiatrists to look upon man not only as a product of his perception but also of his imagination and to examine and treat the individual on the strength of this postulate. After all, as Santayana said, "In insanity a person does not go out of his mind but into his mind and out of the external world." Thus, the unique reaction of each individual to outside stresses makes him a definite entity different from any other individual. This uniqueness which is emphasized in the field of interpersonal relations, in psychotherapy, in the arts, is an expression of the individual unconscious. This, the psychiatrist recognizes and evaluates during his work. On the basis of this concept this test is a valuable tool in the field of projective technique which will enhance the diagnostic studies and therapeutic efforts of the psychiatrist.

40 5TH AVE., NEW YORK, N. Y.

ELECTROENCEPHALOGRAPHIC CORRELATES OF THE ELECTROSHOCK PROCESS

MAX FINK, M.D., and MARTIN A. GREEN, M.D.

In the course of an evaluation of the role of altered brain function in the electroshock process, the relation between electroencephalographic change and behavioral response has been re-assessed.

Subjects and Method:

Eighty consecutive electroshock patients have been studied. All patients received electroencephalograms before treatment, on a day after a treatment at weekly intervals during, and following the course of therapy until the records had achieved their pre-treatment characteristics. Treatment procedures varied, including unidirectional and alternating current electroshock, and subconvulsive technics with Pentothal premedication. Treatment was usually instituted at three times per week for 12 to 20 treatments. Patients who failed to develop a clinical response, or EEG changes of significant degree, were subsequently treated at 5 to 10 times per week.

The EEG records were classified for degree of delta activity into "high," "middle" and "low" degree delta records using the following indices: the percent-time delta; highest percent-time delta in any lead; slowest wave in the record; highest amplitude of delta; and duration of burst activity. (Arch. Neurol. & Psychiat., 78: 516-525, 1957.)

Evaluations of change in behavior were made by the supervising psychiatrist at the height of the electroshock effect; and ratings of improvement were made two to three weeks following the termination of therapy.

From the Department of Experimental Psychiatry, Hillside Hospital, Glen Oaks, N. Y.

Results:

1) The appearance of a high degree EEG delta activity during the second and third weeks of treatment was significantly correlated with change in behavior and ratings of improvement.

3) High EEG delta activity was induced in patients receiving convulsive electroshock only, and was not observed in subconvulsive therapy.

3) Alternating current instruments induced high degree EEG delta activity earlier than unidirectional instruments, but by the 4th week of treatment, the differences were eliminated.

4) There was a direct relation between the degree of EEG delta activity and the frequency of treatment; and an inverse relationship to age.

Conclusion:

1) There is a relationship between the degree of EEG delta activity in the EEG and clinical change in behavior.

2) The time of the appearance of EEG delta activity and its persistence is related to:

a) induction of grand mal seizures;

b) type of current employed;

c) frequency of treatment; and

d) age of the patient

3) Early and sustained high degree electroencephalographic delta activity is a necessary, though not sufficient, pre-requisite for improvement in the electroshock process.

Book Reviews

THE MIND OF THE MURDERER: W. Lindesay Neustatter, M.D., B.Sc. (psy.), M.R.C.P., Physician in Psychological Medicine, The Royal Northern Hospital. Cloth. Pp. 232. $4.75. Philosophical Library, 15 East 40th Street, New York 16, N. Y. 1957.

The author presentes a cross section of different types of murderer, discusses each of them as to relatedness of the particular personality defect and psychopathology which they severally represent. In a number of instances, where the specific defendants had already paid the extreme penalty, the author describes the cases by their true names where, as capital crimes they were perpetrated by so-called "celebrated murderers." As to other cases, the author has used pseudonyms as illustrative material, and has thus avoided implicating or intimately involving others.

The author suggests that the book, which is written in very non-technical language, would be of greater interest to the layman than it would be instructive to the specialist in psychiatry. However, modesty should not be without reward, because in addition to affording very interesting reading, the book's contents are rich in illustrative material descriptive of the many types of psychopathology where murder supervenes. I have had the pleasure of reviewing the author's previous book titled "Psychological Disorder and Crime," and find that he has made the content and context of this work as equally interesting. The book is very informational for the lay reader, is eruditely written, and may well be used with profit by the psychiatric profession and those concerned with or interested in the various aspects of the psychopathology of homicide.

Lewis J. Siegal, M.D., LL.B.

THE HANGOVER by Benjamin Karpman. Charles C. Thomas, Springfield, Ill., pp. 526, and index. $9.50.

It is strange that in the welter of writings about alcoholism in its various aspects more attention has not been paid to the hangover. Probably considered an accessory after the fact, it has been given little notice except in cartoons and in its more distressing medical aspects. The most important parts of it, the depression, the overwhelming guilt, and not infrequently the remorse, have been passed over.

To Dr. Karpman there is reflected in the hangover "virtually in toto all psychological aspects of alcoholism." In a discussion of their hangovers the individuals seem to recreate their hates, their fears, angers and sorrows, and particularly their overwhelming guilt.

The author acknowledges the good work which has been done and is being done on the physiologic and metabolic aspects of alcoholism, but he feels sure that the problem will never be solved except in psychological terms. Hangovers, he says, provide the royal road to the understanding of the emotional life of the alcoholic.

The work consists of seven chapters devoted to the stories of male alcoholics and descriptions of their hangovers, and seven concerned with the same aspects of the problem in females. Each is given a name beginning with A. In addition to the patients' stories, Dr. Karpman comments upon the points made and at the end of the chapter recapitulates and interprets what has been going on. Section 3 of the book compares and contrasts the male and female cases—the personality problems, the emotional factors, and the mechanisms. The last chapter is a synthesis of the whole problem posed by the hangover.

One particular aspect of the book probably should not be picked out and dilated upon, but certainly the story of Axel—objective and bitter as it is—gives food for thought. The hospital physician could learn a lot by the description of the lengths to which the addict will go to get paraldehyde in large doses. The deception practiced by alcoholics in various situations beggars description. They stage fights, feign hallucinosis, exaggerate tremors, with soap suds they feign epileptic fits, etc. These, of course, are the denizens of the "Skid Row" alcoholic world and what is said is not true of the garden variety of chronic alcoholic; but then, the "Skid Row" habitués were once only garden variety themselves.

Every hospital and medical library should contain this book. It is well written, interesting and enlightening. I suppose, though, the author's final chapter sums it all up pretty well: "No one will ever be able adequately to put into words the mental and physical anguish, the terror and despair of any hangover."

Francis J. Braceland, M.D.

A TEXTBOOK OF CLINICAL NEUROLOGY: Israel S. Wechsler, M.D., Consulting Neurologist, The Mount Sinai Hospital, New York. Pp. 782, 179 figures. $11.00. Cloth. Eighth Edition. W. B. Saunders Company, West Washington Square, Philadelphia, Penna., 1958.

The present eighth revision which appears after a five year interval, while essentially retaining its individual style, format and illustrations, contains a more amplified symptomatologic description of parietal and post-central gyrus tumors by inclusion of such phenomena as denial of, or failure of recognition of specific bodily areas, of spatial orientation as well as of tactile hallucinations. The chapter on the epilepsies particularizes in greater detail the etiology and pathology of the convulsive states and the revision is in consonance with the most recent concepts of causality of this baffling paroxysmal state. The book which has so well served as a classic, merits continuance as an authoritative source of reference for both student and practitioner alike. The bibliography at the end of each chapter

has been revised in keeping with present-day advances and the cited references are reflected in the light of newer knowledge in the field of neurology. As in prior editions, the excellent illustrations which in the main are photographs, continue to be placed in their strategic relatedness to the descriptive material dealt with in the text.

As a descendant of its many former revisions, the volume contains a well-planned and extensive index and, as a text book continues in the opinion of this reviewer, to take its place among the prominent treatises on the disorders of the nervous system and their clinical approach.

Lewis J. Siegal, M.D., LL.B.

THE CHRONICALLY ILL by Joseph Fox. Philosophical Library, New York. Pp. 229. Price $3.95.

The reader of this book is in for a bit of an awakening, for it is concerned with what has become "one of the most significant demographic and public health problems confronting this nation." Almost everyone has been dimly aware of the increasing incidence of chronic illness, but only a few are conscious of the extent of its ravages. Outstanding among this latter few is the author of this work, an executive who has devoted 20 years to the problem of the chronically ill and one who is "impelled by conscience to present his view to the public at large."

Over a billion man days of labor are lost due to the various disabilities resulting from chronic diseases—this the author indicates would be the equivalent of about one million years of labor or the total life working span of 25,000 persons. This is a dour picture. Just as dour is the hospital picture regarding the chronically ill. There are two hospitals in New York City which take these patients! One woman, whose son is a cripple, located a third such hospital in Brooklyn, but the waiting list spanned five years. In Peoria, New York, it is two and a half years.

All is not black, however. Doctor Henry E. Segrist noted that, once past 50 years of age, everyone has some kind of a handicap. Speaking of himself, he notes that he has three chronic diseases but: "I am still able to work with great pleasure from 9 A.M. until midnight and I enjoy life more acutely now than ever before."

There are nine chapters, a general bibliography, a glossary, and an index, which make up the work. The chapters cover, in addition to the description and scope of chronic illness, rehabilitation, the sociologic, and the economic aspects of chronic illness. The influence of the forthright Doctor Bluestone of Montefiore Hospital upon the author is evident in many places in the book, and chapter nine is given over to a consideration of Doctor Bluestone's penetrating observations upon the need for more adequate care for the chronically ill, for more research, and for better facilities, not just for housing and nursing care.

The book is a sociological approach to the problem of prolonged illness. It is well written and thought provoking and it will appeal to readers interested in medical and paramedical problems, as well as those who are just interested in sick people and their welfare.

Francis J. Braceland, M.D.

THE MERCK MANUAL: Charles E. Lyght, M.D., et al. Cloth. Pp. 1870. Ninth Edition. Merck & Co., Inc., Rahway, N. J., 1956.

The compact volume contains the most recent generally accepted procedures in the various specialties of current medical practice. In each of the clinical entities, the format of definition, etiology, pathology, symptoms, diagnostic approach, course and prognosis as well as up-to-date detailed therapeusis is followed sequentially wherever the particular disease grouping, disorder, or deficiency warrants such arrangement.

The volume is condensed, practical and commends itself to ready reference by both the general clinician and the specialist in his respective field.

Lewis J. Siegal, M.D., LL.B.

PRACTICAL CLINICAL PSYCHIATRY: Jack R. Ewalt, M.D., Clinical Professor of Psychiatry, Harvard Medical School; Edward A. Strecker, M.D., Sc.D., LL.D., formerly Professor of Psychiatry, University of Pennsylvania Medical School; Franklin G. Ebaugh, M.D., Clinical Professor of Psychiatry, University of Colorado School of Medicine. Pp. 457. Cloth. Eighth Edition. McGraw-Hill Book Co., 330 West 42nd Street, New York, N. Y., 1957.

The arrangement of the book is fashioned along text-book format. It presents an opening section which discusses in review the present day speculative theories with respect to personality development and our concepts of behavior as they may relate themselves to genetic, physiological, chemical and epidemiological knowledge. Synopses of the clinical syndromes follow this opening section with presentation of the now commonly familiar descriptions, which, while interspersed by relatively inconsequential material, is nevertheless repetitive and couched in practically the words reflective of the language contained in the official descriptive classification of the Diagnostic Manual of Mental Disorders prepared by the American Psychiatric Association and in use since 1952. A more illuminating section in respect of its originality of composition, appears in the next subdivision. This part of the book capably details the techniques of practical therapeutic application to the several types of mental reactions and includes, among other disciplines, the methodology of treatment, together with descriptive references as well as indications and contraindications to the use of chlorpromazine, serpasil, Meratran, Frenquel and the barbituric acid derivatives. The book ends with well integrated descriptions and indications for the presently known forms of shock therapy as well as the recognized therapies for alcoholism, narcotic drug addiction and the companion therapies incident to the neuroses and psychoses. Included is also a well organized and extensive bibliography as well as an excellently selected index.

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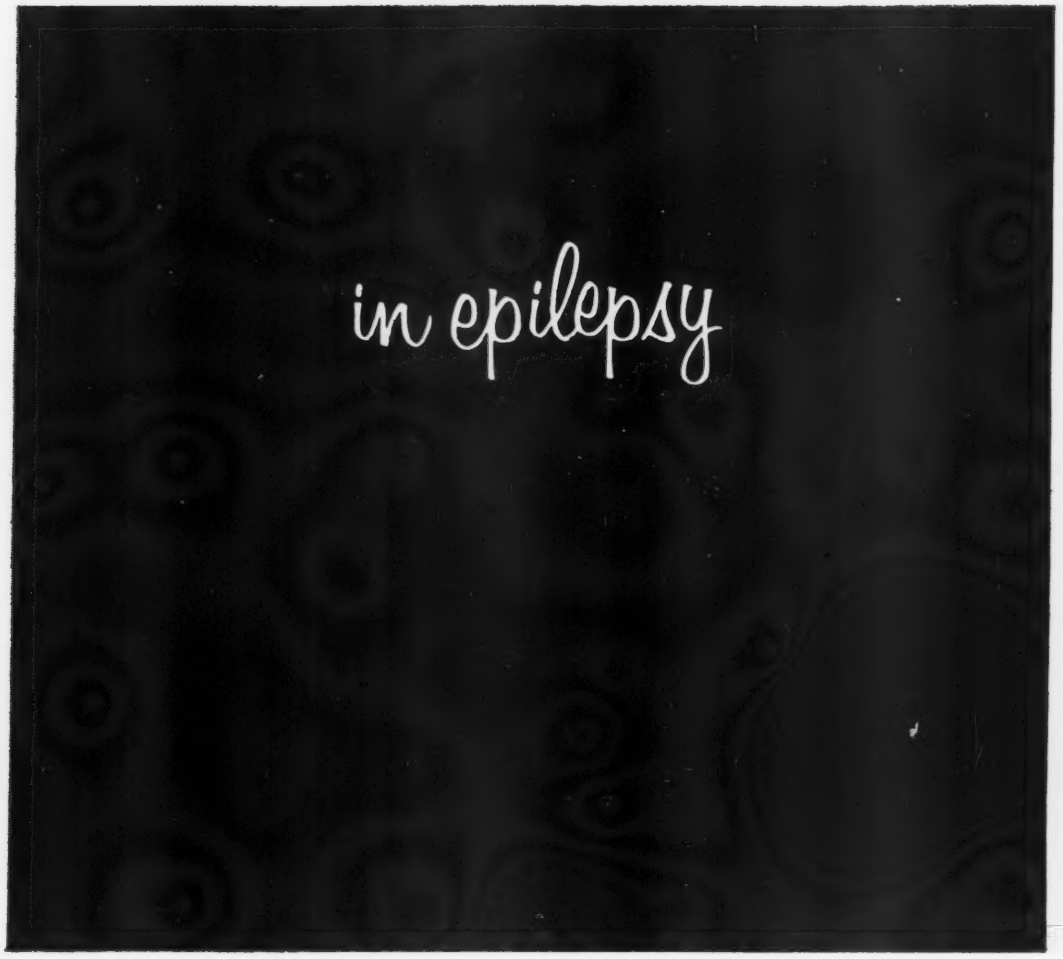

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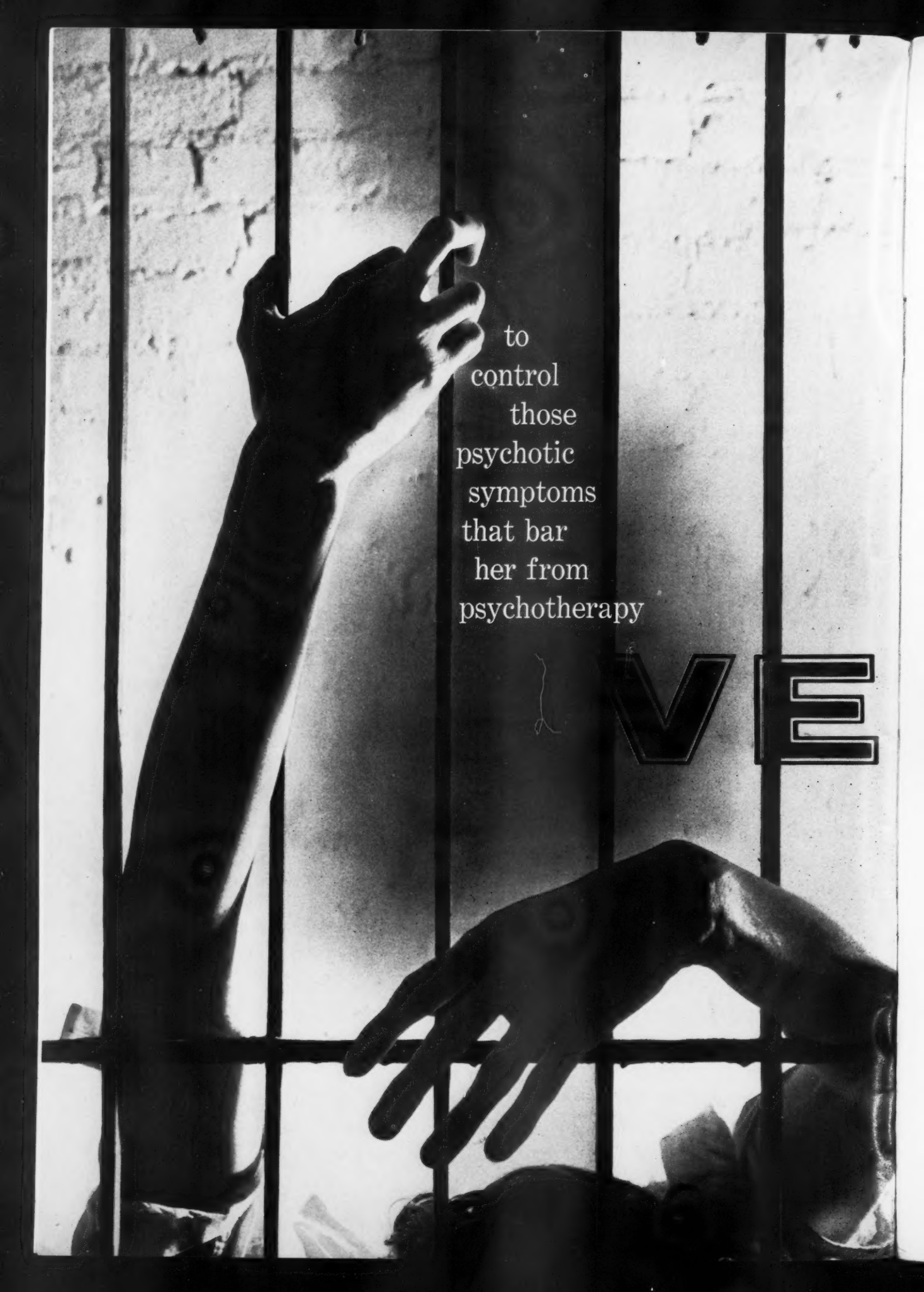
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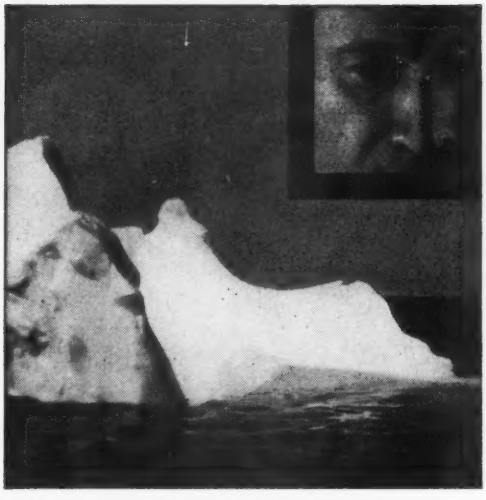

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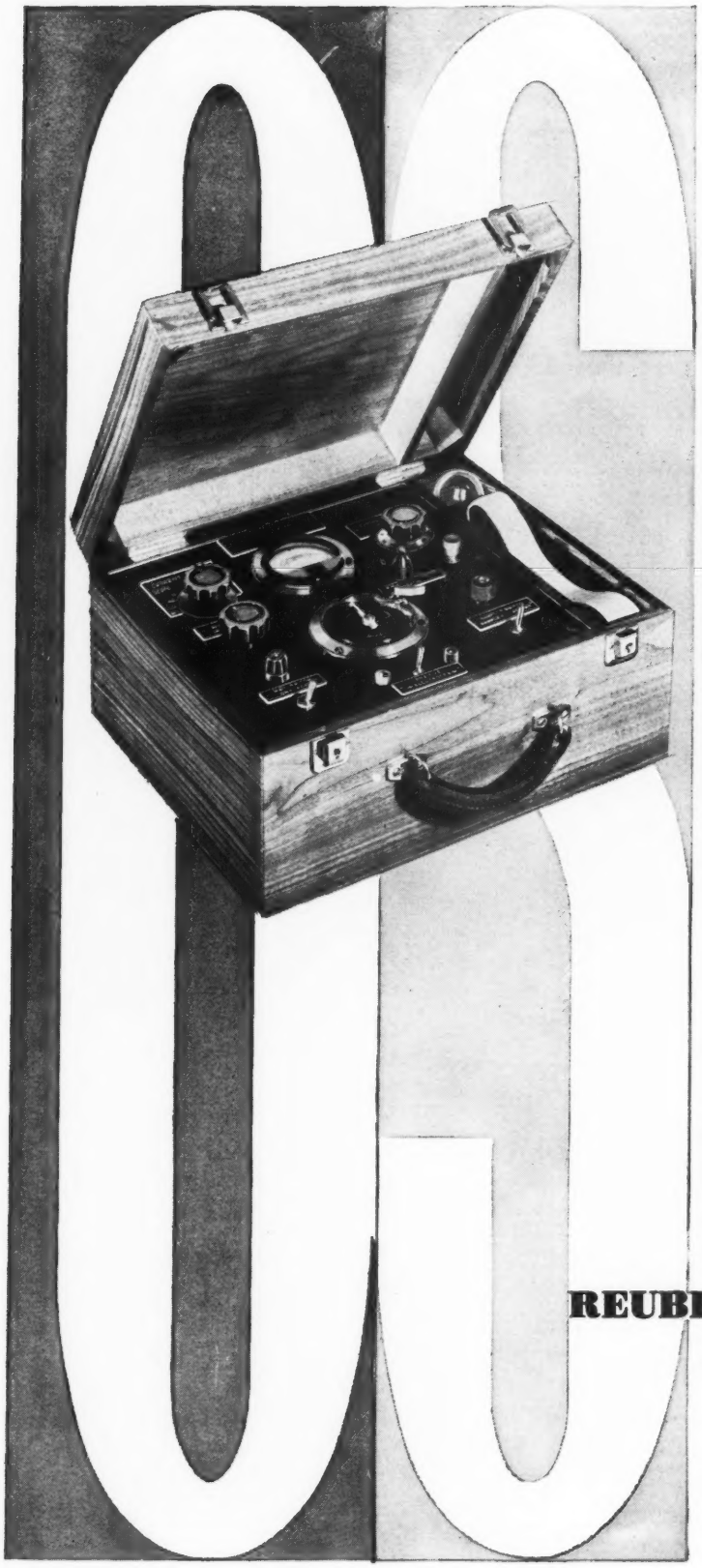

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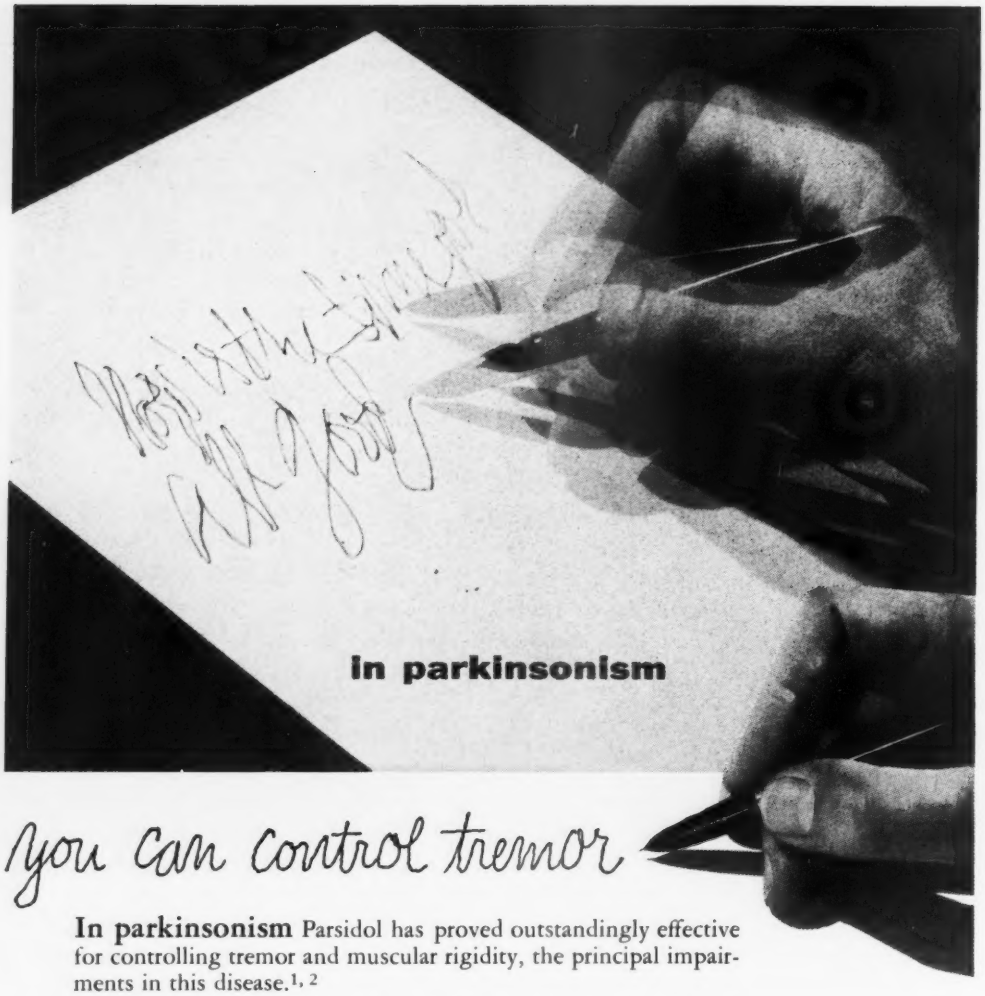

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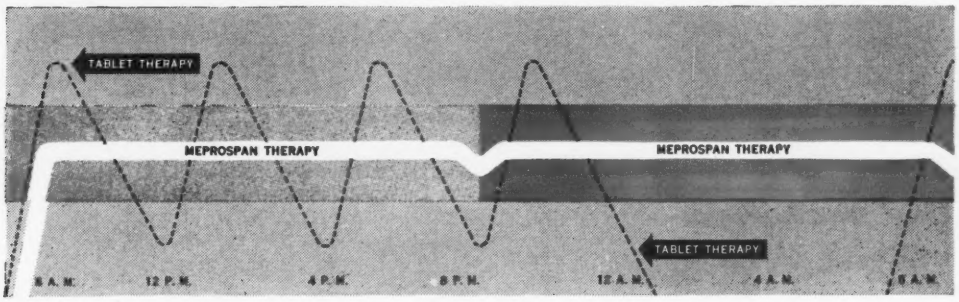

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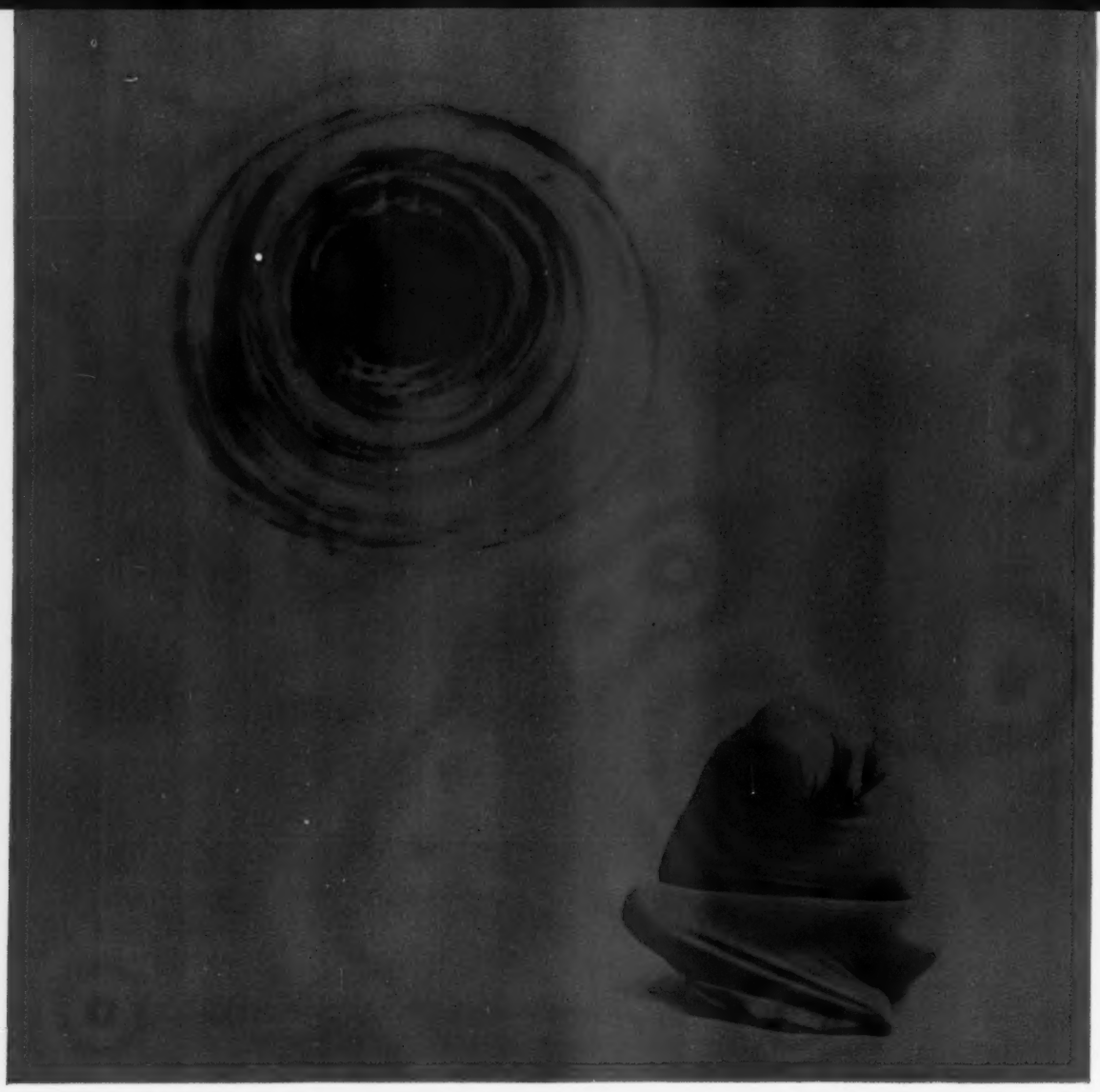

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Teaching as Training for Psychiatric Residents

MARIETTA HOUSTON, M.D., and DAVID W. ALLEN, M.D.

The extent of mental illness and the scarcity of psychiatrists have necessitated careful planning by psychiatric educators in developing psychiatric residency programs. When the final product of such programs is short of professional maturity one tendency has been to lengthen training. But the protracted training in itself can retard professional growth.

The concern about the spiral of ever lengthening training is expressed in an editorial on the "Reintegration of Medicine" (J.A.M.A., April 28, 1956). To quote briefly:

> "It was a favorite idea of John Fiske, one of the best known of American philosophers, that the evolution of man was especially due to the extraordinary prolongation of his infancy. But even Fiske did not picture a situation in which man, having increased expectancy of life to nearly 70 years, would have increased his expectancy of education to nearly 35."

This paper offers no solution, but it suggests one way in which professional maturation can be catalyzed. We wish to call attention to the deficit in the use of teaching as training for psychiatric residents. The early use of residents in teaching, furthermore, can help cultivate a basic supply of much needed teachers of psychiatry.

The report of the 1952 Cornell Conference, "The Psychiatrist—His Training and Development," makes clear that residency programs in psychiatry aim first to develop adequately trained clinicians and second to encourage residents to do some research. In its more than 200 pages the report devotes only parts of two short paragraphs (cf. p. 53, p. 56) to the subject of inducing teaching skills in the psychiatric resident and then only as a desirable aim. The truism that teaching facilitates learning on the part of the teacher is mentioned however (p. 179).

"Trends and Issues in Psychiatric Residency Programs," a recent report by the Group for the Advancement of Psychiatry, has a short paragraph on the objective of teaching residents to communicate to learners in less advanced psychiatric educational levels and in related fields. At least two brochures about residency programs mention that residents are expected to participate in the teaching of medical students.

Experimental Teaching Program

Without attempting to discuss the content or design of the residency programs at The Langley Porter Clinic and University of California in San Francisco and without detailing the voluntary student program which we reported elsewhere,[1] we wish to point up the maturing effects on resident psychiatrists when they served as preceptors for sophomore medical students in work with psychiatric patients. The residents began to develop into effective, interested teachers; gradually to accept more independent responsibility; and to compete in reasonable self-assertiveness with faculty members. The amount of time and effort diverted from being taught to teaching proved doubly rewarding to these residents.

In the fall of 1954 a group of sophomore medical students at the University of California in San Francisco requested instruction about "schools of psychiatric thought." After some discussion, a professor of psychiatry (Dr. Alexander Simon) suggested, instead, a program to give sophomore medical students the opportunity for voluntary clinical experience in the outpatient department of The Langley Porter Clinic. Largely because faculty members and senior consultants did not have sufficient time for student supervision, it was decided to use as precep-

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tor-supervisors third to fifth-year psychiatric residents and fellows and a few young psychiatrists who had recently finished formal training.

Initially the program aimed, not necessarily to cultivate professional growth of the young psychiatrists, but rather to encourage the students' interest and develop their potentialities. The young psychiatrists participated voluntarily, but were given time from their regular clinic schedules. In the two years of its operation the program accommodated 36 students, though a much larger number applied; 28 supervisors took part.

The patients were selected more or less at random from outpatient applicants except that patients with a history of destructive acting out, those with complicating medical problems, and those whose cases required extensive liaison with medical or social agencies were excluded. All patients understood that they would be working with medical students under supervision.

At the beginning of the academic year, after brief group orientation meetings, each supervisor met his student and they arranged to see their assigned patient. Since the students had no formal training in either psychiatry or physical diagnosis, the supervisors performed the initial psychiatric work-ups with the students present. Physical and neurological examinations were included if they had not been done prior to assignment of the case. After not more than five joint interviews the students worked alone with the patients in weekly interviews but met their residents each week for a supervisory hour. In addition, we met the students and supervisors in their respective groups at intervals throughout the year.

The observations reported here were made principally in the group meetings of the supervisors and in individual contacts with them. Written statements about the first year of the program made by some supervisors; the progress of individual students, and their remarks about supervision afforded additional material. Besides the spontaneous student comments, an inquiry about supervision was included in the questionnaire filled out by the students at the end of each year.

Comparison of First and Second Years

The first year the supervisors decided to meet together after the student meetings, which were held irregularly since the students were permitted to decide on their own schedule of meetings. The supervisor group held six meetings. In the second year, the supervisors were asked by the instructors to meet once a month for discussion of the program.

Similar attitudes developed in the supervisor groups both years. An orientation meeting gave the supervisors the opportunity to recognize their hesitance to accept the role of teacher and to share their concern about whether or not they could actually be supervisors. After they had met their students individually the discussion centered more on such practical matters as helping students learn fundamentals of interviewing and deciding on how many interviews to have jointly with the student and patient before leaving them on their own.

The supervisors helped each other find ways to deal with common problems among the students. For example, in a group discussion one of the least experienced residents described his difficulty in handling his student's tendency to miss supervisory hours and their concern over the patient's threats to discontinue treatment. One of the more experienced supervisors then related his way of handling such a problem:

"When the patient said he was going to quit, my student felt this would look bad for him. I told him we had no contract to keep the patient coming in for treatment. He next asked what the rest of the staff would think of me as a consultant if the patient quit. I told him I had no contract either. After this discussion the student could free himself of his concern about the patient's quitting; it was no longer an issue in treatment; and the patient continued to come in. The problem of a student missing supervisory hours is similar to that of a patient missing interviews with a therapist. The patient assumes that missing an appointment will make the therapist angry. The same thing works with the students. My student had to have a dental x-ray and told me he would be a half hour late. Then he didn't show up at all. His apologies were simply that I would be angry. He didn't take into consideration that he was missing something himself, that his anger could be with himself instead of my being angry with him. It might help to express it with the students. It's the same old prob-

lem of less mature persons working with more mature persons."

Such individual methods of managing problems in therapy and supervision served as points of departure for less experienced therapists to develop their own modifications. From the beginning we had adopted the attitude of observant administrators who were providing the framework within which the students and supervisors might attempt to work out the project. After orienting the two groups we tried to avoid any teaching role in the group discussions. We succeeded better in maintaining this attitude during the first year, when the program was new and smaller.

In the middle of both years, however, we had to warn student and supervisor groups of the potential foundering of the project. At this time several students suggested dropping their cases and their supervisors tended to accede. Midyear examinations, vacations, and slackened clinical interest played less part than did the growing discomfort of the students at meeting with patients' manipulations in therapy and more open expressions of aggressive and dependent traits. Some supervisors, though well able to follow such interactions in therapy with their own patients, had failed to recognize the students' accounts of similar interactions. When these matters were discussed the project regained its even keel.

In the second semester of each year the supervisors in their group discussions broadened their interests to include more general concepts of psychiatric teaching. A question brought up repeatedly of how much to permit students to go into their own emotional problems in supervisory time proved to be a difficult, stimulating subject on which no general agreement was reached. We emphasized only that the supervisors were not doing therapy with the students, but acknowledged the necessity for discussing the therapist's responses in interviews as a means of clarifying to the student his interaction with the patient. The supervisors were also informed of their responsibility to see that case material was organized and recorded, and that the limits of the relationship between the therapist and patient were reasonably defined.

At the close of both years of the project the supervisors reviewed the students' accomplishments and their own as teachers; showed interest in general problems of psychiatric education for medical students; and commented on the program's organization in the year to come. Certain differences also appeared in the two years of the program, some the result of planned changes. In the second year the program could be enlarged by a third, since it now attracted new supervisors along with many of those from the first year. In another change, students in the voluntary program were distributed among the seminar sections of the regular sophomore academic course in psychiatry. Some presented their cases to these sections during the year with the help of their supervisors. Encouraged by the productive discussions of the first year's group, we hoped that more frequent group meetings the next year would benefit both students and residents, and perhaps give experienced supervisors more chance to aid the beginners. In retrospect we saw some unexpected changes in which our unwitting shift in attitude had made considerable difference. In the first year, phrases in our notes such as "we need to decide" indicated that the group itself was to develop the project and make the decisions. We rephrased comments, summarized discussions, redirected questions, but did not impose directions.

Our notes of the first meeting in the second year indicate a more pedantic attitude. For example, it was announced that in accord with the decision of last year's supervisors the group would meet each month. When two supervisors from the previous year's program demurred, saying that they now felt less need to meet, we peremptorily set a meeting date for the next month and moved on to another topic. Again, when a new supervisor raised the question whether students could help patients, we cut off the discussion by turning to the experienced supervisors who chorused that certainly students can help patients. The young supervisor had no chance to explore feelings behind his question—possibly his concern whether he could help the student to help the patient. Certain developments in the second year probably were the result of this

change in attitude. In the first year the supervisors almost immediately disposed of the question of formal instruction in psychotherapy for the students. They felt that to assign reading to the students or to give them class instruction would be, in part, a misdirected outlet for their own anxiety about being preceptors. The students in the first year did not request formal instruction in psychotherapy. In the second year the more frequent meetings, presumably to allow discussion, actually stifled the ventilation of feeling and opinion. Consequently the supervisors did not discuss their anxiety over their teaching role, and in the middle of the year the students insistently requested formal instruction in psychotherapy. After carefully considering the request, we decided against it, in favor of focusing the supervisors' and students' efforts on the specific problem of working with their patients. In general, problems emerged in the second year in the form of indirect expressions of anxiety and resentment: a certain refractoriness of some supervisors who missed meetings, failed to report critical developments in therapy, and dropped cases.

Summary and Comment

A program at the University of California School of Medicine in San Francisco offering systematic teaching experience to psychiatric residents and psychiatrists recently graduated from training has been described. The emphasis here is on teaching experience as a training method.

In mulling over the data collected during the two years of work with the supervisors we have come to several conclusions about the use of teaching as training in a psychiatric residency. These conclusions, though difficult to document, can be verified by others with experience with young teachers in the field of psychiatry.

First, the supervisors themselves in general became more adept clinicians as they experienced the new perspective of the therapeutic process between the students and patients. Some of the supervisors commented that they could better discern what was happening with their own patients and more readily find factors impeding the patients' progress.

Second, the supervisors became aware, sometimes with surprise, how much they had actually learned in their own training, now that they had the opportunity of comparing their knowledge with that of beginners in the field.

Third, in most instances, the experience of the supervisors whetted their appetites for further teaching. Several of them continue to do some teaching at the University of California or affiliated institutions and others have combined teaching functions with work elsewhere. They express a satisfaction in teaching which many found for the first time in the program described.

Of the 28 supervisors who participated in the program over the two-year period only eight do no current teaching. One of these is in military service, two have recently begun private practice, and the remaining five have full time positions that allow no time for regular teaching although three of them have expressed interest in future teaching.

Of the 20 supervisors now teaching, six are still in training but volunteer for teaching work. Of the 14 who have finished training seven give several hours a week without pay, and seven have half or full-time teaching positions.

While teaching by psychiatric residents, at least informally, is not new, its maturational effects have been too little noted. Few experiences sharpen the resident's formulation of his own ideas about psychiatry more than does the challenge of communicating with bright, inquiring, unintimidated students, and few things make him more acutely aware of gaps in his own knowledge. Residents are also encouraged by the experience to identify with their own teachers and to compete with them.

Since training in psychiatry, like that in other medical specialities, has been extended, it is important to develop teaching skills and interests early to make the most of the period over which the psychiatrist can impart his knowledge to others in the field of medicine. Our experience with residents who do supervision is that as beginners they do as well as some of the more experienced clinicians who begin teaching work. The students' favorable evaluation of what they learn from the resident supervisors, in com-

parison with teaching by more experienced psychiatrists, attests to the competence of the teaching by residents. Perhaps the resident's own proximity to the student status even aids his communication with students. The trainee with his entire career before him is usually willing to invest at least as much in the acquiring of teaching skills as is the physician with a successful practice who may be drawn into part-time teaching. Clinical experience does not necessarily fit a physician for teaching even though some related principles are involved in working with patients and in working with students.

An additional advantage is that when the resident encounters problems with which he is unable to cope he can turn to his consultant for help. Sometimes the help consists of more objective evaluation of the situation or of a solution that the consultant has found useful in his own experience. But it can also enlighten the resident and enhance his confidence to discover that at times his consultant has no better solution to suggest than the resident has himself thought out.

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Effect of Combined Chlorpromazine and Dextro-Amphetamine on Severely Depressed Patients

EUGENE DAVIDOFF, M.D.*

As clinicians have long realized, administration of electric shock therapy in psychotic depression is sometimes contraindicated by medical considerations and is frequently complicated by reactions on the part of the patient or his family. Cardiac conditions or advanced age may virtually rule out EST; the clinician may decide against its use because of arthritis or tuberculosis. Even where medical reasons do not contraindicate EST, its use is often attended by extreme fear or reluctance of the patient and opposition by his family. These factors can be important in treating patients who might be considered "borderline" candidates for EST. A possible substitute for EST, in these cardiac, aged, or "borderline" cases, appeared in a combination of the tranquilizer chlorpromazine and the stimulant dextro-amphetamine sulfate.

A definite benefit to patients exhibiting depression prior to chemotherapy appeared possible by combining chlorpromazine and dextro-amphetamine. The purpose of this study was to determine whether a combination of the two drugs would relieve depression which was not accompanied by anxiety or agitation. Therefore, only patients who exhibited no anxiety or agitation were selected. Although chlorpromazine alone has been reported effective in some depressed patients,[1,2,3] it has generally been regarded as a depressant. The decision to use a combination including chlorpromazine was made with the realization that the patient's depression might become exacerbated. Attention to this possibility seemed warranted. Addition of dextro-amphetamine to chlorpromazine regimen to counteract any drowsiness or other depressant effects has been reported.[4,5,6] However, the anticipated benefit from the combined drugs in this study was an amelioration of the original depression, not the neutralization of chlorpromazine-induced depression.

Material and Methods

Twenty patients showing relatively severe depression (in motor, psychomotor, and emotional spheres), but manifesting no anxiety or agitation, were selected for this study. All had been examined upon admission to the Ellis Hospital Psychosomatic Unit, In-Patient Department.

Ten patients were treated in the hospital; all of these would have been certified to a state mental hospital, had they failed to improve, or would have received electric shock if the drug had not been given. Two had re-

*The author, now deceased, was chief psychiatrist, Ellis Hospital, Schenectady, N. Y.

ceived EST previously, but had been confused and apathetic, as well as depressed, afterwards. In the remaining eight patients there was resistance to EST either because of physical reasons or age.

The other 10 patients were treated on an out-patient, day-boarding basis. Two of these had been started on hospital treatment but had been discharged against advice. The other eight patients in this group were so severely depressed that return to the hospital was indicated but not carried out because of family pressure, fear of EST, and/or previous failure to maintain improvement after hospitalization. The chlorpromazine-dextro-amphetamine regimen was instituted on a trial basis prior to re-hospitalization. In these cases the family provided adequate supervision during those periods when the patients were out of the hospital.

At the outset of the study 10 patients received four-to-eight 25 mg. tablets of chlorpromazine daily. A separate 5 mg. tablet of dextro-amphetamine was given with each tablet of chlorpromazine. Thus, daily dosages were between 100 mg./20 mg. and 200 mg./40 mg. The other 10 patients were given the two drugs combined in single capsules in the same 25 mg./5 mg. ratio. Daily dosages ranged from four to six capsules (100 mg./20 mg. to 150 mg./30 mg.).

Results

Of the 10 hospitalized cases, seven were discharged from the hospital as much improved. One patient showed sufficiently rapid improvement to be discharged within a week. This patient was treated on the day-boarding basis and recovered after a month. The remaining six were discharged after a month to six weeks.

Three cases were not discharged but showed slight improvement. Since their improvement was slow, two were transferred to a sanatorium for more prolonged care, and both showed continued improvement after three months. One patient showed improvement after three weeks, but his relatives and family physician became impatient for administration of EST. Further improvement made on EST was afterward maintained on chlorpromazine-dextro-amphetamine.

The most dramatic results in this group are illustrated by the following case history:

B.O., a 79-year-old female suffering chronic brain syndrome with cerebral arteriosclerosis and associated psychosis, was admitted to the Psychosomatic Unit on April 14, 1956. She was severely depressed and markedly inadequate. Her reaction time was very slow and she complained of weakness and lack of desire to do anything. On April 23 she was placed on chlorpromazine-dextro-amphetamine capsules, 25 mg./5 mg., twice daily and chlorpromazine tablets, 25 mg., twice daily.

Her preliminary psychological test indicated considerable slumping and marked organic (mental) deterioration. Personality tests revealed disintegration with marked depressive features, unacceptable degree of contact with reality, intellectual control and conformity of thinking far below the healthy range. Her assets for psychotherapy were extremely limited, since she presented a typical progressive deteriorative pattern.

After administration of chlorpromazine-dextro-amphetamine, the patient gradually became more cooperative and less confused. By May 4 she had become more active and cheerful and wanted to return home. She had gained 14 much-needed pounds during therapy, had begun to smile and to mingle with other patients. She was able to help herself and to do things. She still showed some confusion and mental deterioration in her psychological test after medication. However, she was less depressed and had better contact with reality. She was discharged May 10 as much improved.

All of the 10 day-boarding out-patients showed improvement on the drug combination. Marked improvement was demonstrated by the two patients who had been discharged from the hospital against advice before their inclusion in this group.

The following case history illustrates one of the best improvements in this group:

G.B., a 38-year-old white male, was diagnosed as manic depressive, depressed. With a history of three hospitalizations for psychotic episodes, he had gradually become severely depressed again during six weeks prior to his admission to the Psychosomatic Unit on March 12, 1956. His depression had become so severe that he had lost his position as a junior executive and had had to turn to a part-time job selling Christmas cards. Tearful, slow of speech and movement, he felt inadequate and hopeless, lacked energy and enthusiasm. He regarded himself as a poor husband, father, and son, and a miserable failure. Treated as a day-boarding out-patient, he was given chlorpromazine, 25 mg., q.i.d., and dextro-amphetamine, 5 mg., twice a day.

His preliminary psychological test, indicated that he was of superior intellect but with constricted and depressed personality. He lacked motivation and

was disinterested in the test. His intellectual control, outlook on reality, and conformity of thinking were below the level expected in one of his intellectual caliber, although they were just within acceptable limits. Some features of inadequate personality were uncovered. Little ego strength remained but some assets for psychotherapy were present.

After one week of day-boarding treatment, he was greatly improved. Continuing on the medication, he became a full-time salesman, then made application for more specialized work, as his hopes and zest increased. His coordination was much improved. He became more active, spoke more rapidly, began to feel at ease and to take a definite interest in his mental condition. His psychological test after medication revealed a personality pattern well within the normal range for a healthy adult. His intellectual control, total grip and outlook on reality, and conformity of thinking were well within acceptable limits. Some anxiety, but no depression, were uncovered. Good ego strength was present at this time.

An electroencephalogram after medication showed no significant change from the one before medication. Both electroencephalograms were read as being within the upper limits of normal.

Significantly, none of the 20 patients in the two groups showed increased depression while on the combination. Three patients temporarily given chlorpromazine alone showed increased depression, but this was overcome by addition of dextro-amphetamine.

The psychological examinations uncovered more hidden anxiety than was originally encountered in the mental states of three patients. In general, there was a positive correlation between the psychological tests given before and those given after medication, and between the tests and the mental states of patients before and after medication. The tests indicated general improvement in all cases in the following areas: decrease in amount of depression; decrease in somatic complaints; increase in ego strength; better grip and outlook on reality; better conformity of thinking; and less constriction and withdrawal, resulting in more outgoing behavior.

Sixteen patients received electroencephalograms before and after medication. In only three cases were toxic changes of any consequence noted. Mild changes were noted in two others, but their records had been abnormal previously.

Side effects of the combined drugs consisted chiefly of some anxiety and tension in a majority of the cases. Transitory increase in emotional lability occurred in some patients. Insomnia, malaise, itching, changes in blood pressure, palpitation (subjective cardiac complaints), nausea, vomiting, and headaches were noted. Appetite was found to be decreased in a few cases. In all cases these untoward effects were not serious and could be controlled by dosage adjustment and careful observation of the patient. One seventy-year-old arteriosclerotic developed cardiac failure, but this could not be definitely attributed to chlorpromazine-dextro-amphetamine. She improved after bed rest in the hospital.

It was soon found that in most cases 125 mg. to 150 mg. of chlorpromazine, given in divided doses four-to-six times daily, was the optimum dosage, since neither increased depression nor disturbing side effects were noted in this dosage range. Similarly, 10 mg. to 15 mg. of dextro-amphetamine, given in divided doses two or three times daily, produced the best results without bringing about undue agitation, insomnia, discomfort, or side effects.

The optimum dosage of combination in sapsule form was found to be 25 mg. of chlorpromazine and 5 mg. of dextro-amphetamine two or three times daily, supplemented by 25 mg. tablets of chlorpromazine alone two or three times, in the late afternoon and evening.

Discussion

Evaluation of these results in the light of the purpose of the study indicates that the combination of chlorpromazine and dextro-amphetamine does ameliorate depression. The combination brought about improvement in all 20 cases of depression without anxiety or agitation. After adjustment of dosage to the individual patient, chlorpromazine and dextro-amphetamine enabled both groups to proceed in the course of therapy without depressant effects. Negatively, the combination did not increase the basic depression in any case. The ability of dextro-amphetamine to neutralize chlorpromazine-induced depression appeared in the improved response to the combination by the three

patients who exhibited increased depression when started on chlorpromazine alone.

Chlorpromazine, in combination with dextro-amphetamine, seemed to produce a stimulating, rather than a depressing, reaction. This might be called a mood-lifting, stabilizing effect, eliminating or greatly reducing swings of temperament. It was achieved without excitement in the majority of cases.

The possible importance of the combined drugs has been stated above. The combination appears to offer a method of therapy for patients in whom EST is medically contraindicated. Results in this series give promise also of a therapeutic alternative for "borderline" EST candidates. Such an alternative could be of considerable benefit to both patient and clinician in those cases complicated by extreme reaction against EST by the patient or efforts at intervention by the family.

The patients treated with chlorpromazine and dextro-amphetamine demonstrated general improvement in the broad areas covered by the psychological tests, as well as in the final evaluation of their mental states. Moreover, by careful attention to dosage, this improvement was achieved without serious side effects.

Summary

1. Twenty patients showing severe depression without anxiety or agitation were treated with a combination of chlorpromazine and dextro-amphetamine sulfate. This series included 10 day-boarding out-patients and 10 hospitalized patients.

2. Optimum daily dosage of tablets in most cases ranged between 125 to 150 mg. of chlorpromazine in four to six divided doses and 10 to 15 mg. of dextro-amphetamine, also in divided doses. Optimum dostage of chlorpromazine-dextro-amphetamine in 25 mg./5 mg. capsules was found to be two or three capsules daily, supplemented by two or three 25 mg. tablets of chlorpromazine in the late afternoon or evening.

3. All 20 patients exhibited improvement of their original depression on the combination. Seven of the 10 hospitalized patients were discharged.

4. The patients demonstrated general improvement in the broad areas covered by pre- and post-treatment psychological tests, as well as in the final evaluation of their mental states.

5. Side effects—consisting chiefly of some anxiety and tension—were not serious and could be controlled by dosage adjustment.

6. Results in this series give promise of a therapeutic alternative for "borderline" EST candidates.

Author's Note: The medications for this study were supplied as 'Thorazine' (chlorpromazine) and 'Dexedrine' (dextro-amphetamine sulfate) by Smith, Kline and French Laboratories, Philadelphia, Pennsylvania.

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Childhood Schizophrenia: A Review

JAY KUTEN and SANDRA L. KUTEN

A review of the literature of a disease state customarily begins with a broad definition of its outstanding features and provides a concise statement of what is known of the diagnosis, etiology and pathogenesis of the condition. Unfortunately, our present knowledge of childhood schizophrenia is too limited to allow any such generalization. In fact, Adler[1] said recently that there was no proper claim for recognition of a disease entity: "Children who have been diagnosed as schizophrenic should be called 'atypical children.' The word schizophrenic should be reserved for adults with a characteristic symptom pattern."

A wide range of opinion exists concerning the various features of the disorder. Much of the difficulty is encountered at the outset, as Dr. Adler suggests. The difficulty is not only in precise definition, but the question exists whether at present there *can* be any definition. From this point of departure obstacles in the path of understanding increase at a geometric rate. We have not even yet come to a universal agreement about adequate diagnostic criteria. For this reason, morbidity statistics, concepts of pathogenesis, etiology and especially treatment reports cannot always be accepted as valid and generally acceptable.

In the last twenty years an enormous amount of work has been done in the attempt to understand childhood schizophrenia, to learn what is the basic pathology of the disorder, to find what creates the problem and what can be done for prophylaxis. One of the greatest barriers in the path of continued progress is language. There is no standard nomenclature which describes schizophrenic children. Every author is forced to develop his own descriptive terms and diagnostic criteria to fit those terms. One group (Bender, Bradley) has called attention to differences in the age of onset. Kanner[35] has divided schizophrenic children with reference to the mode of onset, acute or insidious. He has also described a group which he calls "autistic infants," whose disability is noticeable from birth or soon afterward. Margaret Mahler[40] differentiates disturbed children on the basis of developmental and etiological considerations. She recognizes two types which she calls "early infantile autism" and "symbiotic infantile psychosis." Another view is that represented by Rank. Rank[46] and her colleagues of the Boston Psychoanalytic Institute prefer to discard the term schizophrenia entirely and use the name "atypical child."

This lack of standardization of nosologic terms has serious implications for research and speculation. Although the term "schizophrenias of childhood" has begun to appear as a sort of compromise, diagnostic criteria differ with the clinical experiences of each investigator. Research suffers from this apparent deficit in communication. There appears to be a great duplication of effort and the applicability of results to all the "schizophrenias" remains in question.

The differences in terminology may be superficial for clinical descriptions are strikingly similar. One of the first descriptions of schizophrenoid disorders in children is Heller's Dementia Infantalis.[30] He lists the following manifestations:

"1. Normal mental and physical development during the first years of life.

"2. Onset of illness between the third and fourth years.

"3. Psychic and intellectual changes demonstrated by ineffectiveness of educational and recreational influences; marked restlessness, excited and occasional anxious behavior.

"4. Appearance of speech disorders in the beginning and during the course of the illness.

"5. Maintenance of motor functions and complete lack of focal symptoms from the central nervous system.

"6. Non-imbecilic facial expression and looks ('Blick') . . . tics and stereotyped movements."

Although Heller's disease is probably associated with an organic encephalopathy Weygandt cited by Yakovlev[51]) this does not detract from the similarity between Heller's description and those of the moderns.

Leo Kanner,[34] writing of early infantile autism, stresses the following factors: An

From Washington University School of Medicine and School of Social Work, St. Louis, Mo.

inability to relate to people from the beginning of life ("self-sufficiency of autistic children"); extreme autistic aloneness; failure to make the anticipatory motor responses normal to a 4-month old. (This consists of a grimacing and tensing of neck and back muscles upon being picked up); use of language without affect, not for communication; excellent rote memory; pronominal fixation (misuse of personal pronouns); anxious desire for maintaining constancy of environment; stereotyped motor behavior; good relation to objects. In short, the autistic child relates to objects better than he does to persons. A generalized affective deficit exists parallel to a disturbance in verbal and physical transaction of the child with the environment.

Bradley[18] lists eight traits which he found prominent in schizophrenic children:

> "(1) seclusiveness, (2) irritability when seclusiveness is interrupted, (3) day-dreaming, (4) bizarre behavior, (5) diminution in number of personal interest, (6) regressive nature of personal interests, (7) sensitivity to comment and criticism, and (8) physical inactivity . . . many bizarre forms of motor behavior."

A tendency toward isolation and inappropriate motor function are the outstanding features.

Despert[23] has observed cases which differ as to the mode of onset, acute or insidious. In the acute type she finds three significant symptoms: motor hyperactivity with bizarre patterns, acute anxiety, and mutism. "There were manifest affective changes such as development of antagonism to the mother. . . . Motor and sleep disturbances were present in all cases." Children in whom the disorder began slowly tended to be older than those with acute onset. In the type with insidious onset Despert noticed emotional detachment and inability to differentiate between reality and phantasy. There was also an excessive dependence upon the mother, along with bizarre behavior (non-functional speech) and language deviation.

Mahler[39] distinguishes between autistic and symbiotic psychosis. Autistic children show no signs of effective awareness of other human beings almost from birth. Their motor behavior is rigid; their bodies unyielding. Symbiotic psychotics do not demonstrate any pathology in the first year of life. Their disturbances manifest themselves in the third or fourth year. "The boundaries of the self and non-self are blurred . . . their bodies (seem to be) melting into one's own."

The only attempt to use biometry in defining symptoms of childhood schizophrenia was made by Bender.[12] She compared 30 schizophrenic children with 30 non-psychotic children with various diagnoses ranging from behavior problems to organic brain disorders. Her sample is small and her selection of controls open to question. However, there appear to be significant differences in the vasovegetative and motor areas. Vascular and homeostatic abnormalities, motor hypo- and hyperactivity, abnormalities of posture and balance, and voice or speech disturbances are all more pronounced in schizophrenics than controls, with significance at the 0.001 level. Body-image, self-world perception, and reality testing, as measured by such items as identity and reality confusion and "space-time-movement" confusion are likewise more abnormal in schizophrenics (0.001 level). Tonic neck reflexes were also found, but the sample was too small for statistical testing.

Different names are used by these writers to describe the children they have seen. And certainly there are differences in their clinical findings. Yet, basic similarity is evident. Seclusiveness and motor malfunctions, particularly stereotypy, are frequently mentioned throughout these writings. Almost every writer expresses the belief, either in his description or his discussion of etiology, that schizophrenic children cannot readily define the boundary between themselves and their environment. Rank[46] speaks of the lack of an "emotional climate favorable for the formation and differentiation of the self and the establishment of the reality principle." According to Bender,[9] "The schizophrenic child has basic difficulties in boundaries and segregation of physiological and psychological sub-systems." Bakwin[5] feels that persistence of immature behavior "is an indication of the child's pathologic reaction to the outside world in that he is unable to distinguish the 'I' and 'not I.' " Mahler,[39] Ritvo and Provence,[48] and others have all come to similar conclusions.

The feeling that differences of nomenclature and description are superficial to a basic pattern led to this statement of Rabinovitch and Dubo (cited by Hendrickson[31]):

"Because the symptomatology varies with age of onset and the child's developmental level, there are many divergent clinical pictures. . . . Understanding of psychopathology can be simplified by recognizing that, regardless of divergent behavioral manifestations, there is a core problem, a basic disturbance pathognomonic to the illness. This is the child's inability to experience a clear-cut self-percept and to appreciate identities, their boundaries and limits. . . . An earlier traditional view of the basic symptomatology of childhood schizophrenia as being a social withdrawal and an exorbitant phantasy life, with perhaps delusions and hallucinations, has proved itself invalid and has clouded the basic issues. . . . Many of the significant clinical findings . . . represent direct manifestations of the core problem; other symptoms can be understood as secondary reactions to the basic dysidentity. The particular form both the primary and secondary manifestations take depends in large measure on the age of the child."

And Hendrickson closes the citation with this observation: "While most other authors do not employ the term 'dysidentity,' they generally describe in different terms a similar fundamental defect in the child's ego functioning." Questions may be raised as to the validity of these statements; for they are based upon many observations of a large number of writers. And in only one case (Bender) have the observations been tested for statistical significance. However, a large number of children is represented by the totality of descriptions, and the idea of "dysidentity" is a plausible summation and statement of the basic process. This concept of the underlying problem is not an accepted fact and knowledge of etiology is even further in the realm of speculation.

Some features of childhood schizophrenia are relatively clear. There appear to be two critical periods for the onset of schizophrenia. These are the first two years of life, and between the third and fourth years.[8]

The general incidence of the disease is coming to be established with more certainty, perhaps because of the critical diagnostic approach of today's clinicians. Originally, Bleuler[17] estimated that 5% of schizophrenia began in childhood. Kraeplin[37] mentioned 3.5% as the percentage of schizophrenics under ten years of age. In 1955, the National Health Education Committee[44] reported that less than one per cent of hospital admissions diagnosed as schizophrenics were below the age of 15. And Kallman[32] gives the figure 1.9 as the percentage of patients under 15 years admitted to a New York state hospital for schizophrenia. The total number institutionalized annually for schizophrenia has been estimated at 150,000 (Bakwin). These statistics refer to the United States only. J. C. Das Gupta[22] reports that 30% of children hospitalized for psychiatric disorders in India are schizophrenic; this number represents the largest single fraction. The same percentage holds for Indian adults hospitalized for mental illness. Among the Samoans, Margaret Mead[42] has found one catatonic schizophrenic boy of fourteen. Since diagnostic criteria are not uniform these figures are not thoroughly reliable even for the United States. And outside of western culture psychiatry is either undeveloped or the attitude toward mental illness and toward children differs so greatly from our own (Russia, China), as to make any comparison impossible. Finally, figures are unavailable.

Diagnostic difficulties must be borne in mind when we assess follow-up studies. Bender reports that of 500 diagnoses of childhood schizophrenia from 1934 to 1946, between 66% and 87% were confirmed in 1954 and the children had passed into adolescence as schizophrenics. Part of the difference may be traced to diagnostic progress and clinical experience. At any rate, such follow-up studies are rare and are sorely needed.

Males appear to outnumber females. Figures vary from 2.8:1 (Sackler et al.) to 4.5:1 (Kallman and Roth). Bender[14] finds that the ratio of boys to girls increases with age. In Kallman's series and in Bender's, whites outnumber non-whites by the ratio of 4 to 1, and Jewish children outnumber non-Jews. Sackler has found a heavy hereditary taint in childhood schizophrenia and Kallman's findings[32] indicate an early effect of the same genotype which he assumes to be responsible for the basic symptoms of adult schizophrenia. This conclusion is based on comparisons of monozygotic and dizygotic twins in whom one of the twins is schizophrenic.

With one schizophrenic twin, the co-twin was also schizophrenic in 70.6% of the one-egg twins and in only 17.1% of the two-egg twins. This compares with corresponding figures of 69.2% and 10.3% for adults. These results are not completely accepted. As might be expected the diagnostic criteria are questioned. However, it is also true that the adult sample consisted of 691 twins and the pre-adolescent sample contained only 52 sets. Kallman has also found no significant difference in the contribution of either parent. Only 9% of the parents were diagnosed schizophrenics and, as Bender[15] has also noted, a large number of the parents were normal, stable people.

There are currently no clinical tests which can accurately detect childhood schizophrenia. Eickhoff found no significant difference between the EEG's of 46 normal and 50 abnormal children. I.Q. tests produce a wide range from superior to subnormal.[14] Sackler reports an increase in blood glutamic acid levels, high thyroid and histamine tolerance. But these results have not led to construction of clinical tests.

When we consider etiology we pass into an area of speculation. Nothing is really known, although Kallman's work is indeed suggestive. A great many factors have been proposed but the basic work remains to be done before the etiology can be established.

The suggestions include heredity and inborn metabolic defects (Kallman, Sackler), a specific encephalopathy (Bender), stresses of œdipal period and impact of life situation (Mann, Mahler), and the mother-child relationship (Rank). The last of these deserves some attention because this opinion is widely held, particularly among psychoanalysts. Kallman's findings are contradictory. Most authors who believe that the mother-child relationship is basic to the whole problem are unique in that they present so few cases in support of their theory. Nor do they test this hypothesis with biometry. Peck, Rabinovitch and Cramer[45] studied the parents of over 200 schizophrenic children and found the one characteristic of the group to be their reaction to the child's illness. They felt that the parent's problem and the distorted family relationships stem from the nature of the child's illness. Erickson[25] remarks:

It would be impossible to do justice to all of the theories that have been devised. Since knowledge is so limited, personal judgment must currently be the rule. However, one point of view seems appealing because its attack is that of the biologist. Biology is such an old friend to medicine that occasionally it seems completely new. Bender has put the problem this way:

> "There is pathology of behavior in every level and in every area of integration of patterning within the functionings of the central nervous system, be it vegetative, motor, perceptual, intellectual, emotional, or social. Furthermore, this behavior pathology disturbs the pattern of every functioning field in a characteristic way. The pathology cannot, therefore, be thought of as focal in the architecture of the central nervous system, but rather as striking at the substratum of integrative functioning of biologically patterned behavior."

What the disturbance is and what levels and areas of integration are disturbed is the problem which Yakovlev[51] sets himself. "The empirical answer to these questions depends on the terms in which the problem of the organization of human behavior is stated." According to Yakovlev[51,52,53] living organisms are action systems in evolution. In the organization of the behavior of living systems three space referable spheres of motility are distinguishable; the sphere of motility of *visceration*, the sphere of motility of outward *expression* of internal states or expressive sphere, and the sphere of motility of *effectuation*. These three spheres of motility differentiate in three time-referable phases of evolution of living systems from the phase of *primordial* motility, universal to all living systems (e.g., energy metabolism at the molecular level) to the phase of species specific motility, *evolved* by the species and *no longer in evolution* (e.g., species specific modes of metabolism, reproduction, outward expression of internal states—changes of posture, mimicry or "motional" expression—and specific modes of effective transaction with the environment). Finally the third phase of evolution in the organization of behavior emerges—the phase of motility derived from the life experience of the individual organism, particular to that organism and in constant evolution. Yakovlev assumes that the phase of derived motility ("acquired" or "learned") emerges in

"The role which 'maternal rejection' or special circumstances of abandonment plays . . . is still debatable. I think one should consider that these children may very early or subtly fail to return the mother's glance, smile and touch . . . an initial reserve which makes the mother, in turn, unwittingly withdraw. . . . In those cases of infantile schizophrenia which I have seen, the primary deficiency in sending power was in the child. . . ."

One of the considerations which weighs heaviest against this concept of a defective mother-child relationship is that, taken by itself, it appears somewhat primitive in that it isolates cause from the individual.

phylogeny gradually from the phase of evolved motility (species specific, "innate," "inherited," "instinctive") but only in the ontogeny of man does it become the dominant phase of behavioral organization. In man this personalized phase of ontogenic evolution is manifest in symbolized thought as a specifically human mode of visceration derived from the personal experience of individual living, *in language* as a specifically human mode of expression of internal state (thought) derived from the personal experience of social living, and in *manufacture* as a specifically human mode of effectuation derived from the personal experience of intelligent (communicable) and meaningful (socially relevant) transaction with the external environment. The collective corollaries of the constant evolution of human behavior are the progressive intellectualization, socialization, and industrialization of specifically human life experience. Yakovlev proposes that in the ontogeny of life experience of schizophrenic children the behavior which reflects it follows the normal pattern, or nearly so, through primordial and evolved phases of species specific evolution. The impediment is, entirely or nearly so, in the evolution of patterns derived from the personal experience of individual and social living—the symbolized thought, the language, and the manuficient motility of effective transaction with the environment. "They do things *to* things but not *with* things."

The basic problem is manifest in the failure of schizophrenic children "to establish a differentiated space relationship to their own body, to other persons, to objects about them, and to outer space in general." We have pointed out the fact that other writers tend to draw the same conclusion.

For Yakovlev, the development of *consciousness,* which makes possible the derivation of thought, language and manufacture, depends, in turn, upon abstractions of space as a dimension, time as a duration, and of "body-self as a living experiencing 'I' in relation to space 'outside.' " These abstractions are derived from experience of life at evolved levels, i.e., species specific modes of respiration, etc. The basic abstraction is that of space. The time and self-image must be constantly referred to the experience of space as a dimension. For example, we can remember places, objects and persons without reference to time, but the memory of the time of an experience is possible only with reference to oneself, and objects or persons in space. Abstraction of space develops throughout infancy beginning with the vague delineations possible in the newborn. Development of the concept proceeds along with the child's abilities. He is able to recognize and distinguish persons. He begins to reach for, then crawl toward, things. Gradually, there develops complete differentiation of the body-occupied-space from the space outside the body. Normally, this occurs at about the time when the child learns to erect himself, to walk, and thus, to measure space accurately with his own body. Time as a dimension appears in consciousness at about this age. From this stage of development, the normal child goes on to derive thought, language, and manipulative ability. He continues to develop these areas throughout life, constantly deriving from them the values of conscious experience of living—social values.

In the schizophrenic child, this development is not possible, because he is incapable of abstracting the basic consciousness of space, time, and the self. The three areas of behavior, internal, external, and effectual, are represented in the central nervous system by three longitudinal synaptic systems. These are respectively, "the diffuse synaptic system of visceration (autonomic system), the intermediate synaptic system of expression of internal states (extrapyramidal system), and the outermost synaptic system of effectuation (pyramidal system)." Levels of

integration are represented latitudinally within the nervous system. The spinal cord and brain stem represents the primordial integration of behavior. The cerebral hemispheres represent the evolved level of patternings. The derived level of integration of behavior, the experience of living in thought, language and manufacture, is represented by the cortical association areas. And Yakovlev concludes:

> "It is at this highest latitudinal level that, *a priori*, one should look for the morphologic and functional correlates of the want of derivation of the socially relevant behavior in early childhood schizophrenia."

Unfortunately, very little has been found in the way of specific or diffuse organic pathology. The positive result from the autopsy of one case of Heller's disease by Weygandt is mentioned in Yakovlev's paper. And Heller's disease is now often classified as organic brain damage and not as childhood schizophrenia. Of course, if Yakovlev's thinking is ever proved right this distinction will have been a matter of semantics. At present, sufficient autopsy material is not available and the significant careful neuropathological work-ups have not been made. It is possible that our present methods are not good enough to detect subtle changes in the brain. Perhaps, as Kornfield suggests, the changes are on a submicroscopic level. Acceptance of Yakovlev's reasoning depends, at least in part, upon the validity of the generalization that the basic process in childhood schizophrenia is the child's inability to develop a clear picture of himself as opposed to the world outside.

The specific conclusion that brain damage is involved is not in opposition with all other views. It does not eliminate the possibility of specific etiologic factors. So that heredity may be an important determinant as Kallman[32] suggests. Brain damage may have been produced by anoxia as Camilla Anderson[4] and Bakwin observe. Or an endocrinopathy may be involved (Sackler et al.). One of the significant contributions of Yakovlev's ideas is the attempt to elucidate, in a dynamic way, the process of development of normal integrated behavior so necessary to adequate social function. Since the developmental process is a dynamic interaction of forces, the individual is not an isolated entity. He exists in space and interacts with other individuals to the extent that he can perceive them or experience them in some way. Thus, other individuals, or as Rank[47] stresses, "the mother-child" relationship can effect this development. Of course, the possibility of producing organic brain damage by emotional deprivation has not been definitely proven. However, certain controversial observations of Spitz on "anoclitic depression" do point that way. Spitz[50] found that children who receive no emotional attention in their first few months of life deteriorate into idiocy and may even die.

The concept of behavior and its integration, as a dynamic interaction of forces on various levels of development is one which many investigators will accept, although perhaps not in these terms. Perhaps the conclusions will meet objection. In this connection, Fessard cites the work of Francois and Hoagland, who showed that the *"sense of time"* varies with body temperature according to the laws of chemical reactions. Thus, Bender's demonstration of defective vasomotor homeostasis as well as difficulties of "space-time-movement," may well be an extremely significant contribution.

Although Yakovlev's papers may help to define the process underlying childhood schizophrenia, his belief that the integration of the derived phases of behavior are represented by the associational areas of the cortex may meet with objections. Furthermore, his opinion, that morphological and functional correlates of Heller's Syndrome should be sought in the cortex, may not be borne out, even though it is true that schizophrenic children have often been incorrectly diagnosed as aphasics.

Magoun[43] has demonstrated that the polysynaptic, diffuse-projecting reticular system of the brain stem and diencephalon may be the activator of the cortex which is capable of producing wakefulness. Furthermore, extensive mutilation of cortical grey matter and of association pathways has been performed in man without abolishing consciousness, altering alertness or affecting mental performances. This has led Fessard[26] to postulate, on the basis of electro-physiological consideration of the reticular system, that consciousness, which he defines as ex-

perienced integration, is localized centrally at a subcortical level. Fessard believes that impulses coming from the cortex and from the cord are integrated and "experienced" within the diffuse and poorly differentiated reticular system. These writings have led many to discard the classical concept that integration of experience in consciousness are cortical functions. As Fessard states there is no scientific evidence for a clear-cut choice.

Actually, the theory of Yakovlev does not attempt to localize consciousness. The cortical association areas, in his view, are merely the representatives within the nervous system, of the pattern of derived behavior. Integration of experience of total behavior, primitive, evolved, and derived, in the unique state called consciousness may occur elsewhere. The cortical association areas, which make up so much of the cortex, are the neurological correlates not of consciousness but of the derived patterns of behavior.

This distinction between total integration implied in "consciousness" and partial integration of various behavioral patterns, deserves notation here. Every pathologic finding adds to our knowledge of what is normal. As Bender has said recently,[15] "At present it seems to me that one of the most fruitful areas of investigation into personality development will come from observing and pondering on the young schizophrenic child's efforts to express his problem of body image integrity and distortions." Although Yakovlev's ideas may not help to define "consciousness," they may enable us to understand some of the basic processes of derived conscious behavior and how they develop.

Granting the possibility that Yakovlev's conceptions may require considerable revisions, his theory remains as an original contribution to the problems of childhood schizophrenia. For this is a disease in which no therapy has been successful. Amphetamines,[11] electric shock,[10] lobotomy (Freeman and Watts[28]), and more recently chlorpromazine, have all been tried with no results. If any progress is to be made, it will come from thought, which, like Yakovlev's, is based upon consideration of basic principles of biology. Kornfield reminds us that "every function of the body—including the activities of the central nervous system—is organic in nature." From this standpoint we can begin to make careful observations of schizophrenic children, clinically and at autopsy. We must subject empirical observations to statistical analysis. We must discard the primitive notion that we can distinguish between 'organic' and 'functional' (Kanner,[36] Cobb[21]). It is only from the dynamic approach to life and to disease that we can hope, some day, to understand childhood schizophrenia.

Summary

An attempt is made to present what is known and what is speculated about childhood schizophrenia in the perspective of history and of attitudes in western culture and in modern psychiatry. Little is known and therefore, epidemiological information of the natural history of childhood schizophrenia lacks credibility. It is the author's belief that the primary obstacle to understanding is the semantic difficulty of defining childhood schizophrenia. Secondly, clinical studies are lacking in statistical evaluation. While nomenclature is variable, clinical descriptions seem relatively similar. This has been summarized in the idea that the basic process of childhood schizophrenia seems to be the result of the child's inability to distinguish the boundary of his body from that of the environment. One theory has been chosen which explains this on the basis of biological consideration of the development of human behavior. It is felt that progress in the field ultimately depends on considerations of biology, accurate clinical study and the use of statistics as an evaluative tool.

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Cranial Neuropathy in Advanced Hodgkin's Disease

(Report of a Case)

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Introduction

Neurological involvement is well known in Hodgkin's disease. (See Table I.) The first to note a patient with spinal and cerebral involvement were Murchison and Sanderson in 1870.[22] While neurological complaints may be an initial manifestation of the disease, the central nervous system involvement usually indicates the beginning of the final stage (due to secondary extension). Martin and Courville[27] state that this secondary spread may occur by extension through intervertebral foramina, involvement of vertebral bodies, or circulatory spread to the spinal epidural fat. Neurological symptoms may be produced by direct pressure due to tumor masses, circulatory effects, or toxic effects of the disease itself. Spinal involvement is more frequent than cranial.

TABLE I

Author	*Hodgkins' Involvement*
Cicala[1]	Compression of nerve trunk peripheral neuropathy
Leschke[2]	Granulomatous invasion of petrous pyramid
Vindizni[3]	Granulomatous invasion of cerebrum
Denny-Brown[4]	Cerebrum, orbit, skull (simulating eosinophilic granuloma) and spinal cord
Lefler[10]	Secondary amyloidosis in cerebellum, medulla, optic nerves (atrophy) and meningo-encephalitis
Taylor[26]	Compression of spinal cord
Sparling & Adams[25]	Hodgkins' sarcoma *primary* in brain
Sparling, Adams & Parker	
Bergman, Netsky & Zimmerman[30]	
Jackson & Parker[29]	
Martin & Courville[27]	Cranial dura matter
Fein & Newill[7]	Granuloma with cerebral invasion

Sparling, Adams and Parker[25] state that there are no proved instances of a non-sarcomatous form of Hodgkin's disease originating in the cerebral tissue, although they reported invasion of the brain from lesions of the bones of the skull or the intracranial dura. The occurrence of isolated masses within the substance of the brain with lesions in other viscera is less frequent. An example is the case of Von Hecher and Fischer[31] where the tumor was found not to approach closer than 1 cm. to the dura and evidence of dural reaction could not be demonstrated. Secondary intracranial lesions arising from foci in the tonsils, orbit and retroperitoneal lymph nodes have been described by Jackson and Parker.[29] These authors report some type of involvement in the central nervous system in 16% of the autopsied cases of Hodgkin's sarcoma.

The following report deals with multiple cranial nerve involvement in advanced Hodgkin's disease.

Case Report: Johns Hopkins Hospital, #569965, N. J., 34 years old, white female.

The diagnosis of Hodgkin's disease was made in 1951 following biopsy of a supraclavicular node. She developed lymphadenopathy, hepatosplenomegaly, anemia, malaise, night sweats, cough, pruritus, and extensive pulmonary infiltration by Hodgkins tissue. She received X-ray therapy and six courses of nitrogen mustard therapy at 20 mgm per course, each about 6 months apart, in addition to numerous blood transfusions. In March of 1954 cortisone 200 mgm a day was instituted, tapering to 25 mgm t.i.d. Early in May of 1955 cutaneous excoriations and mild jaundice appeared. During this time she noted progressive numbness in the right side of the face and difficulty in vision of the right eye. Later vision was blurred and she saw double in all planes. She then noted numbness in the lower right side of the face, advancing until the lower two-thirds were involved, along with the inner surface of mouth and tongue. She drooled slightly and got her tongue between her teeth when eating. She saw well with one eye covered.

Neurologic Examination: Cranial Nerves: I and II, normal: III, IV, VI, pupils equal at 4 mm., reacted to light and accommodation, and consensually. Extra ocular movements normal. Each eye deviated inward slightly under cover and swung out when the cover was removed. There was no

nystagmus. There was an uncrossed diplopia with the red glass over the right eye, becoming marked on looking to right. With the red glass over left eye, the red image was at the left (diplopia still uncrossed and still marked on looking to right.) There was no vertical diplopia. Convergence was normal. V, VII:—Hypalgesia (almost anesthesia) to pinprick in the second and third divisions of the right fifth cranial nerve. This extended over the lower side of the neck to the second cervical segment and up to the tip of the mastoid process. The posterior aspect of the ear, mastoid process, and inner aspect of the auditory canal (representing VII, IX, and X) were spared. Light touch was impaired over the same area as the pinprick-impairment, but was less impaired than the pain sensation. Corneal reflexes were present bilaterally. Hypalgesia to pinprick extended over the right side of the tongue and the inner mouth on the right. Palatal sensation was not well tested because of an overactive gag reflex. There was very slight facial asymmetry but no facial weakness. The temporals and masseters were strong and the jaw did not deviate. VIII:—Auditory acuity good, bone conduction less than air conduction. IX, X, XI:—The palate elevated well in midline. The trapezii and sternomastoids contracted well. XII: The tongue was symmetrical but regularly deviated to the right on protrusion.

Deep tendon reflexes, abdominal reflexes, plantar responses, muscular strength, sensory examination, coordination, lumbar puncture, skull films, and electroencephalogram were normal.

Discussion

According to Denny-Brown and Foley[4] when Hodgkin's disease occurs as a primary lesion of the brain, it usually is present in the cerebellum with or without evidence of regional lymphadenopathy. Since Hodgkin's disease arises from histiocytes, Sparling, Adams, and Parker[25] agree that it may occur primarily in the brain. They present one case with involvement of the spinal cord followed in five years by a similar involvement of the brain. The initial diagnosis on tissue removed from the spinal canal was reticulum cell sarcoma. The histological distinction between this and Hodgkin's disease is often difficult and the two conditions are frequently confused. Further review demonstrated the presence of typical Dorothy Reed cells.

Demyelinization has been found to be associated with some cases of far advanced Hodgkin's disease. However, if this existed in our case one would not expect such distinct limitation of involvement to cranial nerves on one side. The likelihood of nitrogen mustard toxicity is small since the patient improved after the intravenous administration of 20 mgm. nitrogen mustard on May 27, 1955. Without gross and microscopic examination of the brain, cranial nerves, dura matter, and skull base, further speculation as to the pathology in this patient is unprofitable.

While lymphoid tissue is not a normal constituent of the brain or spinal cord (other mesenchymal elements of the reticulo-endothelial system are present), it may be the source of origin of primary Hodgkin's disease of the central nervous system. Ramon y Cajal and others[32] suspected the existence of mesenchymal cells differing from the types of neuroglia recognized at that time and Del Rio Hortega first conclusively demonstrated the existence of microglial cells as mesenchymal intracerebral representatives of the reticuloendothelial systems.

Hodgkin's disease could also develop intracerebrally from histiocytes of the meninges or the adventitia of the cerebral blood vessels or from microglia in the white and gray matter.

In 212 cases of Hodgkin's disease reported by Vogland,[34] ten had central nervous system involvement, all had spinal cord involvement (transverse myelitis) and none had direct cerebral invasion.

Summary

In the case reported here there was involvement of the third, fourth, and sixth cranial nerves on the right, fifth cranial nerve on the right, the seventh cranial nerve on the right, and the twelfth cranial nerve on the right. This clinical picture may be accounted for on the basis of disseminated meningeal implants of Hodgkin's tissue invading the roots of the cranial nerves, although such a pathological situation is usually accompanied by headaches and pain. Similarly the findings may be due to the presence of nodular deposits of Hodgkin's tissue in the floor of the middle fossa, along the route of the fifth cranial nerve, or in the brain stem itself since the diplopia is probably due to a central disturbance.

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Thorazine Photosensitivity

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Clinical trials with Thorazine in neuropsychiatric patients at Perry Point V. A. Hospital suggested that a positive relationship existed between the use of Thorazine and the likelihood of sunburn. We decided to evaluate the degree of pigmentation and the severity of sunburn without knowing which patients were receiving Thorazine.

Forty-eight white male neuropsychiatric patients participating in a sports activity program were exposed to the hot sun for about two hours early one afternoon. Twenty-four hours later these patients were rated on the basis of degree of pigmentation and severity of sunburn. Forty-seven of the patients were rated by both physicians on the following scales:

TABLE I

Scales Used to Rate Pigmentation and Severity of Sunburn

Pigmentation	*Severity of Sunburn*
a. Blonde, red	1. No sunburn
b. Light brown	2. Mild (pink)
c. Dark brown	3. Moderate (red)
d. Brunette	4. Severe (very red)
	5. Very severe (edema, conjunctivitis, blistering)

Because their number was small, patients were divided into low (a and b) and high (c and d) pigmentation groups. Similarly, severity of sunburn was graded as none-to-mild or moderate-to-severe. (The fifth category, very severe sunburn, was not used by either examiner.) In estimating the degree of pigmentation, the examiners agreed in 85.1 per cent of the cases; in rating severity of the sunburn, they agreed in 95.7 per cent of the cases.

The relationship between pigmentation and severity of sunburn was tested by use of the chi-square and was not found to be significant, either for the group as a whole or for the Thorazine and non-Thorazine groups separately.

During the previous week 28 of the patients had not received Thorazine, while 20 received total dosages ranging from 100 to 15,600 mg. Thorazine patients were divided into high (6500 mg. per week and more) and low (less than 6500 mg. per week) dosage groups. When the dosage group was compared to the severity of the burn, the chi-square test was not significant. In this study, then, no significant relationship was found between the degree of pigmentation and the severity of the sunburn or between the dosage of the drug and the severity of the burn.

However, when Thorazine and non-Thorazine patients were compared, the following results were found:

TABLE II

Degree of Sunburn in Thorazine and Non-Thorazine Patients

Sunburn	*Thorazine*	*Non-Thorazine*
None-mild	14	28
Moderate-severe	6	0

The chi-square test, corrected for continuity by Yates' formula, was 12.68, significant beyond the .001 level of confidence. We concluded that the chances of developing a moderate or severe sunburn are increased significantly by the ingestion of Thorazine.

The use of simple countermeasures—special care in avoiding overexposure and the use of such protective clothing as broad-brimmed hats and long-sleeved shirts—seems advisable. Our clinical experience suggests that they are helpful.

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Psychodynamic Drugs

(A Re-evaluation and Report)

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The era of "psychochemistry" is advancing at such a rapid rate that it is difficult to keep up with the new developments in the field. Almost every week, there is brought to our attention a new drug, which might hold the answer to the management of a particularly difficult case, unresponsive to previous therapeutic attempts. Every pharmaceutical manufacturer is unfolding new approaches to the treatment of mental and emotional illnesses, and the chemical armamentarium of the psychiatrist is fast becoming so heavy that it is getting difficult to carry. The drug companies recognize that many million people in this country are potential customers, and that over half of the hospital beds in the United States are occupied with psychiatric patients and half the practice of medicine has to do with patients either wholly or in part emotionally disturbed.

It seems about time to re-evaluate, not so much the medicants themselves, but our attitudes toward them. At the same time a "country psychiatrist" like the author cannot resist the impulse to briefly mention his own experience with three newer agents he has utilized.

Last year I was privileged to listen to a paper on a similar topic by Dr. Jules Masserman. A portion of his paper was extremely thought provoking and I believe it is worthwhile to repeat the following excerpt from Dr. Masserman's presentation:

"In a group of 85 patients treated, 50% showed decided improvement and 75% showed some. Patients who had been wantonly destructive became more placid and clean; those subject to violent outbursts became better adjusted with their environment, and their activities were more easily directed into useful channels following treatment. Patients who required tube feeding took food voluntarily after two or three days. The most lasting improvement was found in those cases previously regarded as having an unfavorable prognosis. When one considers the changes in the environment of the patients treated—lessened disorder, confusion and untidiness and conservation of energy for the nurses and other employees—the results are of still greater value. There is marked reduction in the waste of clothing and bedding through tearing and soiling, fewer articles have to be repaired and laundered, and fewer nurses are required to care for the disturbed patients. One nurse explained, 'Before these patients were treated, I had to struggle with them every morning to get them bathed and dressed. Fights were frequent occurrences. Now I can supervise the bathing of many of them alone.' Failures occur from the fact that when improvement does not take place in a few days, the drug is stopped when it should be continued."

Does this sound familiar? It was written by W. W. Wright in an article published in the *American Journal of Psychiatry,* "Results Obtained From Intensive Use of Bromides in Functional Psychosis," dated 1926.

To attempt to summarize the available literature concerning the psychodynamic drugs including tranquilizers and cerebral stimulants would be a difficult task, in fact it is a lengthy chore only to enumerate the titles in a brief presentation. It has been estimated that several thousand articles are presently in the literature concerning these drugs. My purpose is to re-evaluate our philosophy concerning the use of these medicants and to discuss the difficulties encountered in evaluating the results of any research undertaken.

A disturbed, hostile patient, a depressed, agitated patient, or a demanding, anxious patient presents a therapeutic challenge to a psychiatrist. Early in psychotherapy this challenge is intriguing but after a few visits, the patient becomes impatient and the physician may become frustrated. It is at this point that the true psychiatrist proves himself. For a psychiatrist has to give of himself not just give a pill. Therefore, he must have something of himself to give. Judicious use of drug therapy is unquestionably valuable and at times necessary but there is a difference between tranquilization and ossification, and one must guard against

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Read at Southern Psychiatric Association Meeting October 7, 1957.

the use of drugs to relieve the anxiety of the therapist rather than that of the patient.

It was mentioned earlier that the results with three new agents would be presented. The first of these is Nicozol with reserpine, a combination of nicotinic acid, pentylenetetrazol, and reserpine. The effect of nicotinic acid and pentylenetetrazol in the therapy of psychiatric symptoms in cerebral arteriosclerosis has been reported by many observers.[1,2,3] Pentylenetetrazol, a synthetic organic tetrazol derivative, has long been employed as an effective respiratory and circulatory stimulant.[4] Its action is mainly on the respiratory, vasomotor, and vagal centers of the medulla, but all parts of the cerebrospinal axis are stimulated. Consequently, it improves pulmonary ventilation and circulation, and it helps to overcome cerebral anoxia. Nicotinic acid is a potent peripheral vasal dilator, but whether this effect is transmitted to the central nervous system is not clear. Whatever its mode of action, it seems to produce beneficial effects in elderly patients.[5,6,7,8]

The original Nicozol formula contained 200 milligrams nicotinic acid and 100 milligrams of pentylenetetrazol per dose, combined either in a lactate of pepsin base with 5% alcohol or a capsule form. The dosage was three to four capsules or drams per day depending upon individual response. The results obtained were gratifying, particularly in patients who exhibited little or no agitation. Since many patients with cerebral arteriosclerosis show considerable agitation, restlessness and insomnia, it was decided to add a minimal amount of one of the ataractic drugs to the formula. Reserpine was selected because of its anti-hypertensive qualities as well as its tranquilizing properties. Therefore, .25 milligrams reserpine was added to each single dose.

The preparation has now been given to hundreds of patients by several investigators.[9] The results have been very gratifying, with about 65 to 70% of the patients showing mild to marked improvement. No untoward side effects have occurred and many patients who formerly required constant institutional care now require minimal attention or have been returned home. It is suggested that this combination has potential usefulness in the management of elderly patients with psychiatric symptoms. A more complete report of this study is to be published in the near future.

Cytomel, which clinically is 3, 5, 3 L-triiodothyronine sodium, has been available for about three years for the treatment of hypothyroidism. It is claimed to be a cellular and metabolic stimulant and many reports are available as to its usefulness in the therapy of thyroid dysfunction,[10,11,12] and in certain cases of sterility. Kissin, Jaffe, and others[13] have reported a study of 19 patients with psychic fatigue treated with Cytomel. The majority showed definite evidence of fairly marked vagotonia and panendocrine hypofunction. Morton[14] has reported the benefit derived from Cytomel in the treatment of metabolic insufficiency, in which the main symptoms are chronic fatigue, dry hair, dry skin, irritability and emotional instability. He specifically mentions that depression was relieved in many cases. Several months ago interest was expressed in the possible use of Cytomel in the treatment of mild to moderate endogenous depressive reactions. Such a study has just been completed by our group at the Bowman Gray School of Medicine. It is a small study involving only 30 patients, but the results are interesting enough to present, though not conclusive by any means. Seventeen patients showed obvious improvement, which was evident to the patients themselves as well as to their families and friends. The dosage ranged from 15 to 50 micrograms per day. Improvement, when it occurred, appeared after about two weeks of treatment. There was no apparent difference in the symptoms of the patients who responded satisfactorily and those who did not. Improvement was maintained for an average period of two months, and then the drug was discontinued. Five of the 17 patients who showed improvement have been without the medication for two months and have maintained improvement. The other 12 have also maintained their improvement but have been without the drug for a shorter period of time.

We did as little psychotherapy as possible with these patients. They were given tablets of Cytomel with the comment that, "This is something that might make you

feel a little better. Take some for a few days and let's see." The patients, as mentioned, had mild to moderate endogenous depressive states. They were all able to be treated as outpatient and were at the time of the first visit able to carry out their usual duties, however, with very poor effiiciency. The duration of symptoms of both improved anl unimproved patients varied from two months to two years. There were 15 women and two men in the improved group, and ten women and three men in the unimproved group. I am unable to explain why some patients responded and others did not. I offer no conclusions, only the results obtained in a small group of patients with depressive reactions treated with Cytomel.

Quiactin has now been used by the author for over 18 months. It is a tranquilizing or ataractic agent, which is useful in the treatment of anxiety states and certain tension states. It behaves similarly to short acting hypnotics with the central depressant action generally resembling that of short acting barbiturates. Toxicity studies indicate that it is remarkably non-toxic and non-cumulative in its activity. The dosage ranges from 800 to 1600 milligrams per day in divided doses for outpatients. The drug has an action similar to meprobamate but it seems to me that its activity is more prolonged and the sedative side effect not so marked, while the tranquilizing effect is greater. In one psychiatric hospital, 60 patients were given Quiactin for three months in daily doses ranging from 800 milligrams to 4800 milligrams. During therapy, 14 did so well that they were permitted temporary visits to their homes. Twelve others were sufficiently improved to be granted privileges and improvement in ward adjustment was noted in seven others. The remaining 23 showed no appreciable change. Blood counts, blood pressure, renal and liver function tests were routinely performed with no signs of toxicity observed in any case.[15]

A further group of selected outpatients with a large variety of pathological conditions were treated with Quiactin by another investigator. The majority of these patients had complained of insomnia associated either with their underlying pathology or with tension states. In this group Quiactin was administered in doses of 400 milligrams to 1200 milligrams as a single dose at bedtime. Thirty of the forty patients treated in this manner reported good or excellent results and that they were able to sleep undisturbed. Chronic toxicity studies were carried out in two large neuropsychiatric institutions. In each of these laboratory studies have been reviewed on 100 patients treated with Quiactin. There was no evidence of toxic change in any of the cases.[16]

I have utilized Quiactin in nearly 100 patients on an outpatient basis. Over half of these patients were treated in an industrial setting at the Hanes Hosiery Mill Company in Winston-Salem, North Carolina. The majority of these patients complained of anxiety symptoms, tension headaches, backaches, agitation, and restlessness. In my experience, Quiactin has a minimal sedative effect. Consequently, it has been more useful in patients working around machinery and in those who drive automobiles or trucks as part of their jobs. Between 60 and 75% of the patients treated with Quiactin have showed clinical improvement which became apparent within one week after the start of therapy. No untoward side effects have been encountered in any patients who were given the drug.[17]

I have attempted to avoid the use of a large number of statistics in this presentation, for statistics are like some women: "Once you get them down, you can do what you like with them." At the same time, some figures were necessary. All are familiar with the difficulty in evaluating a drug used with psychiatric patients. The interpersonal relationship between the physician and patient, the dependence and needs of the patients, and the extreme suggestibility of the patients are difficult to eliminate in appraising any drug. Double-blind studies using placeboes are of little value for many reasons, which are obvious to psychiatrists. The element of time is valuable, however, in evaluating drugs in the treatment of psychiatric patients. We are all familiar with the initial enthusiasm to new drugs, followed by the letdown and disappointment in the failures, and then a leveling off process where each agent finally assumes its proper place in our therapeutic armamentarium. It

is my belief that timing is an extremely important element to consider before any final stamp of approval or disapproval is given to a preparation.

On the other hand to cynically reject all new drugs is as unreasonable as over-enthusiasm. New discoveries are rapidly being reported and the ego-stimulating thrill of each new discovery cannot be ignored. The study of psychiatry and of medicine in general, is an ever increasing, ever changing re-education, and to ignore new ideas is in itself unscientific and leads to intellectual and emotional sterility.

One of the unhappy facts which we face as psychiatrists is the easy availability of probably the best tranquilizer—alcohol. Numerous studies have pointed out that many people use alcohol as a sedative or relaxing agent and initially become tranquilized. Unfortunately some people overdose themselves and become so tranquil they can't move. This spoils any means of scientifically evaluating its medical usefulness.

I have attempted to point out in this presentation some of the hazards in effectively evaluating the real benefit of drugs useful to the psychiatrist—to allay the over-enthusiastic and to admonish the over-critical. Three new preparations that have possible usefulness in office or outpatient psychiatry are presented, not as a final word, but only as an initial impression in the hope that others will also evaluate their usefulness and report their findings.

Author's Note: Nicozol used in this study is manufactured and supplies were furnished by Drug Specialties, Inc., Winston-Salem, North Carolina.

Cytomel used in this study is manufactured and supplies were furnished by Smith, Kline and French Laboratories.

Quiactin used in this study is manufactured and supplies were furnished by the Wm. S. Merrell Company.

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Book Reviews

RECOVERY FROM SCHIZOPHRENIA: John Eisele Davis, Sc.D., President, Association for Physical and Mental Rehabilitation. Cloth. Pp. 162. $4.75. Charles C. Thomas, 301 East Lawrence Avenue, Springfield, Illinois, 1957.

The book is replete with testimonial matter which extolls Mr. Roland (a former V. A. employee in the V.A. physical therapy department) and his implementation "of what is probably one of the most activity physiological approaches to the treatment of schizophrenic patient."

Consistent with the author's pre-occupation, with time consuming high praise of Roland, the author imputes to Roland a singularly uncanny technique—". . . which makes a sharp break from traditional concepts . . . with the added criticism that . . . authoritarian measures are imposed . . . with insufficient recognition of the need . . . of the patient."

Whether in an effort to write in a humorous vein, or whether in a serious attempt to show Roland's substitutive medical background the author has this to say: "Roland's experience is contrary to the many indications in medical literature. . . . The role of Roland remains unchanged in relationship to the tranquilizing drugs . . . (his) earliest recollections were playing with water as medicine . . . he always wanted to be a doctor . . ." The further on one reads, the more one wonders what singular therapeutic achievement he, the author wants the book to convey when he says: "It is hoped that those interested . . . may find in this rather conglomerate collection of . . . empirical observations, hypotheses, hunches . . . and lures" a methodology for the reactivation of schizophrenic patients. The book gives us these further words of assurance that the title of the book as well as the therapeutic method are both equally undependable when the author says: "First

of all, the title Recovery from Schizophrenia will appear overly ambitious . . . (and) . . . neither the author nor Roland presumes to lay down any final hypothetical psychodynamics of this process . . . —clearer formulations . . . may come later."

If written as a testimonial, the book, numbering some 160 pages, between cloth covers, serves well to extol the 'method' of Relaxation and Motivation, under the appellation "Roland's Method." The book can hardly be permitted, however, by any stretch of the imagination, to the ascendancy of its glowing title, "Recovery from Schizophrenia." That its author went overboard in his manner of recommendation of the text, as well as of the personality—the recipient of his plaudits, this reviewer can well understand. Nevertheless one is hard put to follow through the 'total push' of the author's enthusiasm when he describes but another modality to be added to the already existing long list of others, as aid to the physician in carrying out his treatment in cases of schizophrenia.

Lewis J. Siegal, M.D., LL.B.

LIVER-BRAIN RELATIONSHIPS: Ian A. Brown, M.D., Ph.D., Associate Professor of Neurology, University of Minnesota. Pp. 198. Cloth. Charles C. Thomas, Springfield, Illinois, 1957.

The author presents comprehensive review studies of the pertinent literature as well as clinical studies carried out upon individual patient groups. While he offers no definite explanation for the biochemical effects that underlie neurological symptoms ascribable to hepatocerebral relationships, the author suggests that the defects are presumably reversible and minimal and in all probability the symptoms are due to alterations in enzyme and ionic systems resulting either in synaptic transmission or defective axonal conduction. It is equally postulated that though in the majority of cases there were present hyperbilirubinemia, anemia, thymol turbidity, and serum globulin elevation, as well as positive cephalin-flocculation findings—the degree of hepatic dysfunction is not ascertainable by microscopy, nor can the degree of cerebral involvement be prognosticated by a study of liver function. In view of these criteria the author frankly presents the opinion that it is dangerous to relate the cerebral function to any individual liver function test; and in addition, refrains from advancing any specific correlation between liver function tests and clinical symptomatology, or, between cerebral manifestations and the presently known tests of liver function.

The author authoritatively suggests on the basis of obvious personal and collaterally-studied clinical background, that though much has been written on the matter of relationship between liver and brain, the situation still remains a medical problem to be cared for by the internist and the neurologist. As the solution rests in the depths of biochemical phenomena, a cooperative alliance between the researches of the internist, neurologist, surgeon and biochemist appears to be the only answer to the relationship of this clinical complexity.

The author, in presenting in scholarly style, the presently known clinical intimate correlations between liver and brain, bravely admits that the normal metabolic relationships between these two great organs is but partially understood and heroically refrains from expressing definite conclusions. He merely presents the book as a form for discussion in the light of current knowledge respecting the relationships between these organs. This he has done, in the reviewer's opinion, without pretense at a solution of the hepato-lenticular riddle.

The book is written in scientific and unassuming style and should serve admirably as a current refresher of hepatic study for those interested in a fuller clinical understanding of the correlative factors between liver and brain.

Lewis J. Siegal, M.D., LL.B.

PATTERNS OF ABNORMAL BEHAVIOR: Max L. Hutt and Robert Gwyn Gibby. Pp. 452. Cloth. Allyn and Bacon, Inc., 41 Mt. Vernon Street, Boston 8, Mass., 1957.

The book presents a useful contribution to the understanding of human behavior and the varieties of their divergences. The text emphasizes the major areas within the subdivisions of medicine insofar as they relate to the special branches of psychiatry, neurology and pediatrics and equally discusses the modifying potentials of their correlative disciplines in the spheres of anthropology and sociology as well as the interdependence of training and development of mental and moral faculties attained through methodized education, clarifying the wholeness of these influences and their resultants upon human behavioral reactions.

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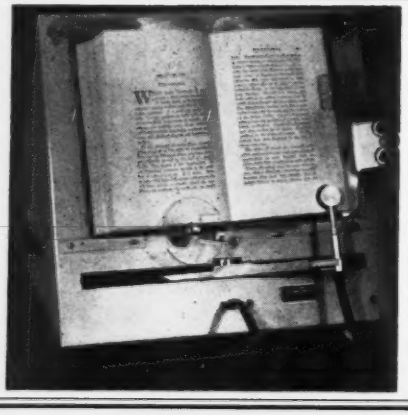

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